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University of California Bulletin

THIRD SERIES. Vol. VI, No. 6

PROSPECTUS

OF THE

COLLEGE OF AGRICULTURE

1913

JANUARY, 1913

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UNIVERSITY OF CALIFORNIA
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ADMINISTRATIVE BULLETINS OF THE UNIVERSITY OF CALIFORNIA

1912-13. No. 7

ORGANIZATION OF THE UNIVERSITY

The University of California is an integral part of the public educational system of the State. As such it completes the work begun in the public schools. Through aid from the State and the United States, and by private gifts, it furnishes instruction in literature and in science, and in the professions of engineering, art, law, medicine, dentistry, and pharmacy. In the Colleges of Letters, Social Sciences, Natural Sciences, Commerce, Agriculture, Mechanics, Mining, Civil Engineering, and Chemistry these privileges are offered without charge for tuition, to all residents of California who are qualified for admission. Non-residents of California are charged a tuition fee of ten dollars each half-year. In the Professional Colleges, except that of Law, tuition fees are charged. The instruction in all the colleges is open to all qualified persons, without distinction of sex. The Constitution of the State provides for the perpetuation of the University, with all its departments.

Letters of inquiry concerning the College of Agriculture should be addressed to the *Dean of the College of Agriculture, Berkeley, California.*

For the following circulars of information concerning the several colleges and departments of the University apply to the *Recorder of the Faculties, University of California, Berkeley, Cal.*

1. The Circular of Information, Academic Departments (Colleges of Letters, Sciences, and Engineering, and the first two years of Medicine). Containing general information about the University, its organization, government, faculties, requirements for admission both to graduate and undergraduate status, requirements for degrees and teachers' recommendations, expenses.

2. The Annual Announcement of Courses of Instruction in the Academic Colleges. Published annually in July. Price 10 cents. Sent by mail by the Recorder of the Faculties for 15 cents.

3. The Announcement of the Summer Session in the Academic Colleges, published annually in March. Sent free.

For calendar of the University for 1913–14, see p. 3 of cover.

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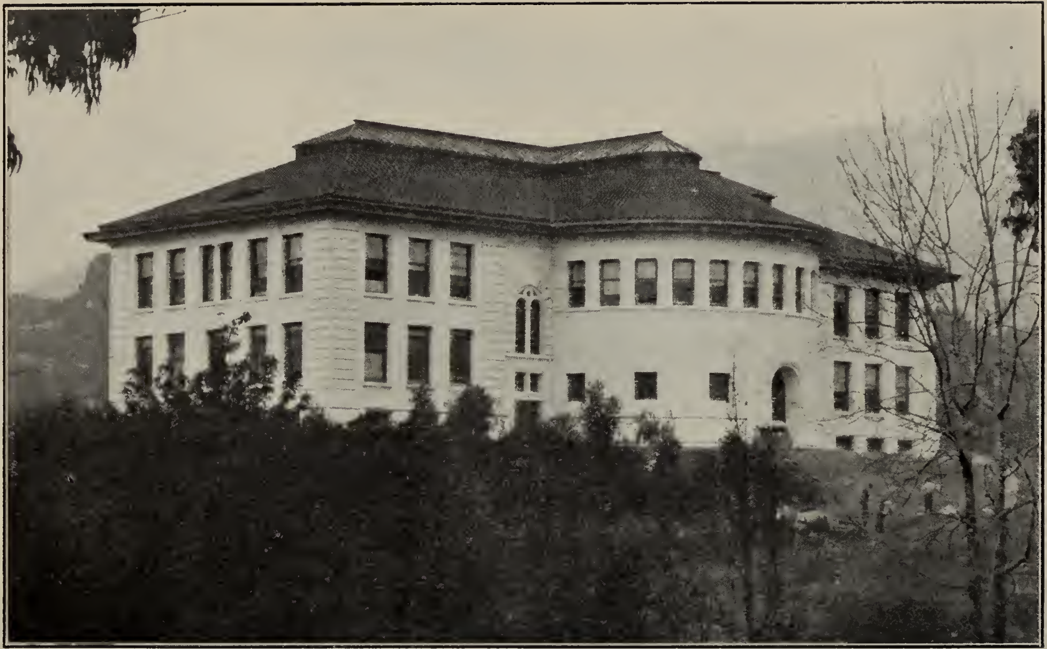

AGRICULTURE HALL

Agriculture Hall—"Agriculture is not only an industry: it is a life. This building stands for the preservation of that life: for its elevation and such a distribution of its ideals as will flavor the whole life of the country."—Judge Peter J. Shields.

AGRICULTURAL STAFF

Benjamin Ide Wheeler, Ph.D., LL.D., President of the University of California.

Thomas Forsyth Hunt, D.Agr., D.Sc., Dean of the College of Agriculture, Professor of Agriculture, and Director of the Agricultural Experiment Station.

[1]Leroy Anderson, Ph.D., Professor of Dairy Husbandry.

W. H. Arnold, B.S., Instructor in Chemistry and Botany, Davis.

E. B. Babcock, M.S., Assistant Professor of Agricultural Education.

H. S. Baird, B.S., Assistant in Dairy Industry, Davis.

G. Barovetto, Viticultural Assistant, Davis.

S. H. Beckett, B.S., Instructor in Irrigation, Davis.

H. L. Belton, Instructor in Shop Work, Davis.

F. T. Bioletti, M.S., Associate Professor of Viticulture and Viticulturist.

F. H. Bolster, B.A., Instructor in Botany and Horticulture, Davis.

L. Bonnet, I.A., Instructor in Viticulture.

W. W. Bonns, M.S., Assistant Professor of Pomology, Riverside.

J. C. Bridwell, B.S., Instructor in Entomology.

D. L. Bunnell, Secretary to the Director.

J. S. Burd, B.S., Associate Professor of Agricultural Chemistry, in charge of Fertilizer Control.

P. S. Burgess, M.S., Instructor in Soils.

W. T. Clarke, B.S., Associate Professor of Horticulture and Superintendent of University Extension in Agriculture.

A. M. Cleghorn, B.A., Principal University Farm School, Davis.

J. E. Coit, Ph.D., Professor of Citriculture.

G. E. Colby, M.S., Assistant Professor of Agricultural Chemistry, in charge of the Laboratory of Agricultural Chemistry.

G. A. Coleman, Curator of the Entomological Museum.

W. V. Cruess, B.S., Assistant in Zymology.

L. M. Davis, B.S., Assistant Professor of Dairy Industry.

J. D. Denny, Foreman in Cereal Work, Kearney Park, Fresno.

W. H. Dore, B.S., Chemist in Fertilizer Control.

J. E. Dougherty, B.S., Assistant Professor of Poultry Husbandry, Davis.

B. A. Etcheverry, B.S., Irrigation Expert.

F. C. H. Flossfeder, Instructor in Viticulture, Davis.

A. J. Gaumnitz, M.S., Instructor in Agronomy, Davis.

C. R. George, B.S., Instructor in Animal Husbandry, Davis.

W. F. Gericke, B.S., Instructor in Soils.

J. W. Gilmore, M.Sc., Professor of Agronomy.

G. P. Gray, M.S., Chemist in Insecticide Control.

J. W. Gregg, B.S., Professor of Floriculture and Landscape Gardening.

F. L. Griffin, M.S., Instructor in Agricultural Education.

E. H. Hageman, Instructor in Dairying, Davis.

H. M. Hall, Ph.D., Assistant Botanist.

C. M. Haring, D.V.M., Assistant Professor of Veterinary Science.

F. M. Hayes, D.V.M., Instructor in Veterinary Science.

W. B. Herms, M.A., Assistant Professor of Applied Parasitology.

P. L. Hibbard, B.S., Instructor in Agricultural Chemistry.

E. W. Hilgard, Ph.D., LL.D., Professor of Agriculture, Emeritus.

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[1] Absent on leave 1913.

W. T. Horne, B.Sc., Assistant Professor of Plant Pathology.
W. G. Hummel, M.S., Assistant Professor of Agricultural Education.
Thos. Francis Hunt, B.S., Plant Pathologist.
R. C. Ingrim, Instructor in Shop Work, Davis.
Mrs. Adele S. Jaffa, M.D., Lecturer in Dietetics.
M. E. Jaffa, M.S., Professor of Nutrition.
Jas. Koeber, Instructor in Farm Mechanics.
Katherine Jones, B.S., Assistant in Agricultural Education.
E. J. Lea, M.S., Assistant Professor of Agricultural Chemistry.
C. B. Lipman, Ph.D., Associate Professor of Soils.
R. H. Loughridge, Ph.D., Professor of Agricultural Chemistry, Emeritus.
Anna M. Lute, A.B., Seed Tester, U. S. Dept. of Agriculture (in Co-operation).
B. A. Madson, B.S.A., Instructor in Experimental Agronomy.
F. R. Marshall, B.S.A., Professor of Animal Husbandry.
C. H. McCharles, M.S., Instructor in Agricultural Chemistry.
W. M. Mertz, Assistant in Pomology, Riverside.
M. R. Miller, B.S., Assistant Chemist, Insecticide Laboratory.
J. F. Mitchell, D.V.M., Assistant in Hog Cholera Immunization.
Earl Morris, Field Assistant in Santa Clara County.
J. B. Neff, Conductor of Farmers' Institutes in Southern California.
W. E. Packard, M.S., Experimental Agronomist, in charge of Imperial Valley Station, El Centro.
W. G. Perrine, Superintendent of Greenhouses and Gardens.
[1]H. J. Quayle, M.S., Assistant Professor of Entomology.
C. L. Roadhouse, D.V.M., Instructor in Veterinary Science.
S. S. Rogers, B.S., Plant Pathologist, Whittier.
W. A. Setchell, Ph.D., Botanist.
A. B. Shaw, B.S., Assistant in Entomology.
C. F. Shaw, B.S., Professor of Soil Technology.
[2]G. W. Shaw, Ph.D., Associate Professor of Experimental Agronomy.
C. O. Smith, M.S., Instructor in Plant Pathology, Whittier.
Elizabeth H. Smith, M.S., Instructor in Plant Pathology.
[3]R. E. Smith, B.S., Professor of Plant Pathology.
Mattie E. Stover, B.S., Assistant in the Agricultural Chemistry Laboratory.
A. V. Stubenrauch, M.S., Professor of Pomology.
R. H. Taylor, B.S., Instructor in Horticulture, Davis.
C. M. Titus, M.A., Instructor in Mathematics, Davis.
E. E. Thomas, B.S., Assistant Chemist, Whittier.
J. I. Thompson, B.S., Assistant Professor of Animal Husbandry.
A. R. Tylor,, B.S., Assistant Plant Pathologist, Whittier.
H. E. Van Norman, B.S., Dean of the University Farm School, Davis, and Vice-Director of the Agricultural Experiment Station.
W. H. Volck, Field Assistant in Monterey County.
A. E. Way, Field Assistant in Viticulture, Fresno.
H. H. Warner, Student Assistant in Plant Breeding.
H. J. Webber, Ph.D., Professor of Plant Breeding: Director of Citrus Experiment Station; Dean of the Graduate School of Tropical Agriculture, Riverside.
E. J. Wickson, M.A., Professor of Horticulture.
C. J. Wight, B.S., Instructor in Botany and Horticulture, Davis.
F. H. Wilson, B.S., Assistant in Soils.
C. W. Woodworth, M.S., Professor of Economic Entomology.
H. D. Young, B.S., Assistant in Agricultural Chemistry, Whittier.

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[1] Absent on leave 1913.

[2] Absent on leave January to July, 1913.

[3] Absent on leave until August, 1913.

ACTIVITIES

The College of Agriculture has three phases: research, education, and public welfare.

It meets these responsibilities through more or less definitely organized activities as follows:

1. *University instruction* to students who are candidates for the Degree of Bachelor of Science in the College of Agriculture. The largest possible freedom of election is permitted during the junior and seniors years. For admission see page 24.
2. *University Farm School instruction* to students who have reached the age of 18 years. Applicants under 18 years of age may be admitted if they are graduates of a high school of recognized standing. Other applicants are required to pass entrance examinations in English composition and arithmetic.
3. *Short courses for practical farmers.* These are given at the University Farm during October and November. They are open to any person over 18 years of age without examination.
4. *University extension in agriculture,* including *Farmers' Institutes.* Applications for farmers' institutes should be addressed to the Superintendent of University Extension in Agriculture, University of California, Berkeley.
5. *Research.* Certain funds received from the Federal government can be used only for experimental work. Results of these investigations are published in bulletins and circulars which are sent free upon request.
6. *Graduate work.* Opportunities of an unusual character are offered by reason of the larger number of research laboratories. A special department of graduate work in tropical agriculture has been organized. A complete announcement of the Graduate School will be sent free to university and college graduates.

UNIVERSITY INSTRUCTION

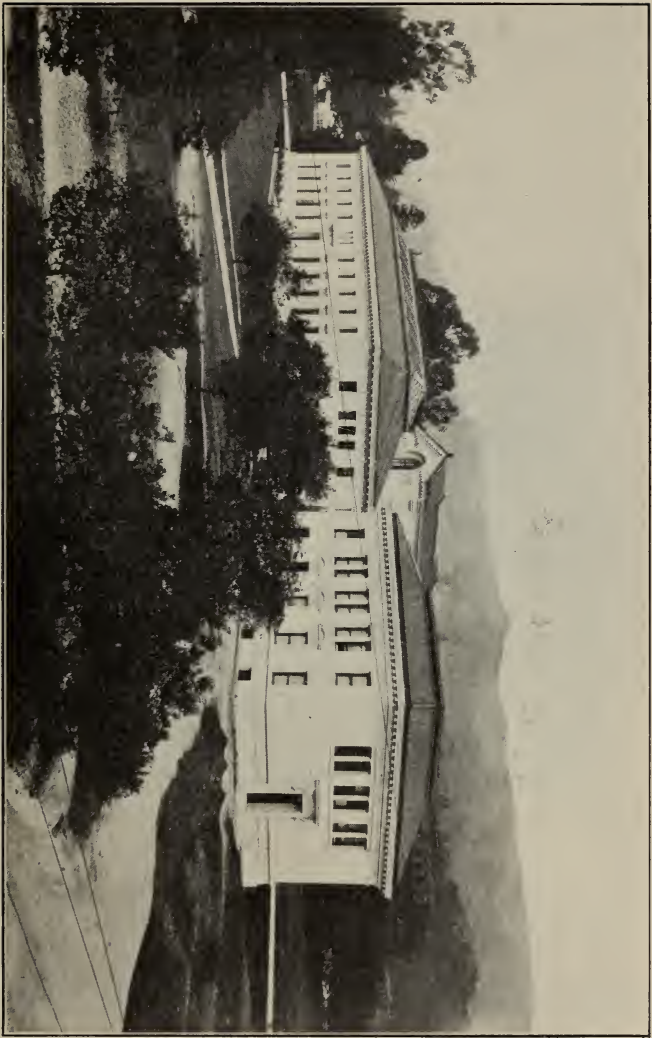
Inspection drill with 1,300 students in line. Agriculture Hall in the rear.

The student who is a candidate for the Degree of Bachelor of Science in the College of Agriculture is required to take a given amount of languages, mathematics, history, economics, sciences and technical studies before graduation. Certain of these subjects must be completed before the close of the sophomore year, as stated on page 27. Before entering upon his junior year, each student is given summer work for eight weeks, carried on as far as possible, as in actual practice, at Davis, Fresno, Riverside, or elsewhere, depending upon the subject in which the student is chiefly interested. Opportunity for instruction for at least one semester at the University Farm, Davis, or elsewhere, is provided.

It is the aim first to educate students who spend four years or more in the College of Agriculture so as to make them a vital force in the progress of the respective communities where they live; second, to create leaders in the dissemination of agricultural knowledge and competent investigators. The university courses in Agriculture give both the mental training that is indispensable to success and the scientific and technical training requisite for efficient work in practical farming, agricultural education or research.

FARM SCHOOL INSTRUCTION

The University Farm School offers a three-year course in Agriculture so arranged that the student may specialize in either animal husbandry or horticulture. This course is planned to meet the needs of students who have reached the age of 18 without the requirements for admission to the four-year courses



California Hall, Boalt Hall, and the University Library form a group of buildings which for the beauty of their architecture, the refinement of their construction and the effectiveness of their arrangement are unique among the university buildings of the world.

offered by the University, or who may not wish to take the time to acquire so thorough training in languages, mathematics and underlying sciences as these courses necessitate. The work is so arranged that graduates of high schools may complete the course in two years. Every effort is made to meet the needs of high school graduates who desire two years of technical training in Agriculture. It is intended to give them a thorough grasp on the principles which underlie the scientific and economic management of soils, crops and animals. For further details see pages 73 to 79.

Entrance to one of the dormitories at the University Farm School, Davis.

THE SHORT COURSES

An Act of the Legislature of 1905 provided for the purchase of a farm for the University of California, to be known as the University Farm and to be used by the College of Agriculture for purposes of experimentation and instruction in agriculture. In addition to other details the Act provided that "short courses of instruction shall also be arranged for in each of the leading branches of agricultural industry, so regulated as to provide for popular attendance and general instruction in agricultural practice."

Conforming to this Act, and with funds appropripated by each succeeding legislature, short courses have been given annually, beginning in the fall of 1908. The attendance and the expressions of hearty appreciation of the courses have been gratifying to the University and have indicated that the plans adopted meet with general public approval. In consideration of the extreme specialization in California agriculture, the courses are divided into units corresponding to California practice, and the length of each unit course is fixed at about two weeks. The units are so timed, however, that any person desiring may attend three different courses covering a period of six weeks. Each course is arranged with a full daily schedule and thus there is little opportunity to pursue two courses simultaneously.

Persons who are able to attend six weeks will find the following possible combinations of consecutive courses:

1. General Agriculture, Dairy Farming and Animal Industry.
2. General Agriculture, Dairy Farming and second and third weeks of Horticulture.
3. General Agriculture, Poultry and Animal Industry.
4. General Agriculture, Poultry and second and third weeks of Horticulture.
5. General Agriculture, Poultry and Home Economics.
6. Persons electing the six weeks' course in Poultry may take, at the same time, the major portion of General Agriculture together with Home Economics, Animal Industry, or the second and third weeks of Horticulture. The fee for the longer course in Poultry covers all charges for the other courses when taken simultaneously with them.

Admission.—There is no entrance examination and no restriction as to sex. Any person eighteen or more years of age and interested in farming is eligible to enrollment.

Expenses.—Living accommodations are found at Davis in hotels and private families with board and room at about twenty-five dollars per month. Board may be secured at the University Farm dining hall at five dollars per week or twenty dollars per month.

A small fee is charged each student to cover cost of materials used in laboratories. Other incidental expenses are: cost of special clothing for certain laboratory and field work; cost of text and note books.

Short course students are given demonstrations in tree surgery and other practical methods of controlling plant diseases.

Reduced Rates on All Railroads.—Davis, the home of the University Farm, is on the Southern Pacific Railway, thirteen miles west of Sacramento, and within easy access from all points.

Attendants upon the short courses may secure a round trip rate of one and one-third lowest first class fare on the receipt-certificate plan from all stations in California, including Reno, Nevada. Stopover privileges may be secured on the going trip if the agent at the initial point is asked for ticket allowing such privileges and by paying the regular stopover fare. No stopovers are allowed on the return trip. In all cases ask for receipt-certificate when purchasing ticket to Davis. This must be signed by the clerk at the University Farm before return ticket can be secured at one-third fare. In no case can one-third return fare be obtained if the purchaser fails to obtain receipt-certificate at his home station.

Railroads granting reduced rates for short courses: Southern Pacific, Santa Fe, Western Pacific, Northwestern Pacific, San Pedro, Los Angeles and Salt Lake.

Excursion Parties to the University Farm.—Special inducements are granted to any locality where a number of people desire to visit the Farm and possibly spend a week at any one short course. For parties of one hundred or more travelling together on regular trains on going trip from any one point a rate is granted of one limited first class fare for the round trip, and if the party numbers one hundred and twenty-five or more the same rate is granted with special train service. Tickets sold on this basis will be limited to seven days from date of sale, except that where the one-way first class limited fare is $10 or more the return limit will be fourteen days from date of sale.

In the short course in horticulture demonstrations in spraying are given.

The attention of Chambers of Commerce, Farmers' Clubs, Granges and Farmers' Unions is called to this excellent opportunity to acquaint their members with the work of the University Farm.

Inquiries.—For further information concerning the short courses address the *Dean of the University Farm School, Davis, California.*

UNIVERSITY EXTENSION IN AGRICULTURE

The College of Agriculture of the University of California believes that it owes a duty to the state at large that can be fully accomplished only when it is engaged to the fullest extent in public service. The following are some of the methods of rendering this service adopted by the College of Agriculture of the University of California to thus serve the people of the State.

Farmers' Institutes.—Meetings of farmers and those interested in farming work are addressed by Experiment Station workers and by men and women engaged in successful agricultural practice. At these meetings problems of local importance are discussed and lines of desirable work described and demonstrated to the end that the successful practice of trained men and women may become the common practice of the locality. It is the aim to make the work done at these meetings of immediate value to the community and the methods of presentation may therefore vary in different regions to meet local needs. The Farmers' Institute is distinctly a people's forum. These meetings are placed where conditions seem to indicate that the need exists.

Agricultural Trains.—The University of California recognizes that the need of bringing to the great mass of farmers certain facts or methods of work which are of vital importance to their business and should receive immediate and general attention. To bring these facts to those most interested in an impressive and tangible form there are sent out what are known as Agricultural Trains. These fully equipped trains of cars are furnished by the different transportation companies and carry conveniently arranged exhibits of material and appliances to illustrate the line of work or practice to which the College especially wishes to call attention.

Movable Schools of Agriculture.—It is fully recognized that while the Farmers' Institutes and the Agricultural Train are of immense value in improving working conditions upon our farms they cannot in the very nature of things go very deeply into the matter of the basic principles underlying a successful agriculture. To meet this condition we have established as a part of our activities what are known as Movable Schools of Agriculture. To carry on this work we establish a regular short course school for enrolling students in localities desiring such an activity. These schools are planned to be in operation for two weeks and usually undertake to cover in an intensive way two or three related lines of agricultural practice. The instruction in these Movable Schools covers lecture, text book, laboratory and field demonstration work. These schools will be established when and where the conditions seem to warrant such action.

High School Lectures.—The College of Agriculture recognizes that its public service must in very large measure meet the needs of those now engaged in agricultural work. It further recognizes the fact that the farming work of the future, to be successful, must be prosecuted by those who have been adequately trained. To assist in arousing the attention of those who will work our fields in the future and to present to our coming farmers and those who are interested in sound educational work the facts that the College deems fundamental to success, there have been established lecture courses to be given in various high schools of the state. The lectures are given by members of the College staff and represent a distinct and valuable means of increasing interest in farm activities.

Field Demonstrations.—To many individuals the written or spoken description of methods of work and lines of practice is not sufficient. To these the field demonstration, the actual doing of the thing advocated, is necessary before the line of practice recommended becomes a part of their working equipment. To meet this "condition which exists" we have already established lines of field demonstration work in various parts of the state. This work will be so expanded as time goes on that the farmer may, by the use of but a small amount of time, visit places where these demonstrations are in progress and there see the work in actual practice.

Correspondence Courses and Reading Courses.—To meet the special needs of individuals, as these needs may perhaps not be met by the efforts previously described, there have been established definite lines of instruction through correspondence and reading courses. In these courses the enrolling student is given instruction along specific lines both by carefully prepared lessons and questions thereon and by well considered lines of suggested reading.

Personal Letters.—The College of Agriculture feels that the best attention should be given to personal and individual inquiries and that its duty is to see that the questions that may be raised receive adequate reply. This branch of our work means the handling of many thousands of letters each year and will receive in the future as in the past the earnest attention of those whose duty it may be to handle the matter at issue.

Personal Visitation.—The intending farmer and the man already in the business may occasionally be confronted by some problem which demands for an adequate answer the investigation and study that only an expert can give it. To meet this condition the College is prepared, with due regard to other demands, to send men out for the specific purpose of studying the problem at first hand and to advise those directly interested as to the proper methods of procedure.

The whole object of the work in University Extension in Agriculture is to render work on the farm and life in the farm home more attractive, more interesting and more wholesome in every sense of the word. In the last analysis the success of the commonwealth depends upon the success of its farms, and the College of Agriculture of the University of California holds itself ever ready to do its duty in ministering to this success.

RESEARCH

Science has proven to be an indispensable factor in furthering the progress of agriculture. The achievements in agricultural science, however, have done scarcely more than to suggest the possibilities of future development. The Station looks back over an honorable record of thirty-seven years under the direction of Hilgard and Wickson, during which period a fundamental groundwork has been laid that it is believed will be enduring. Particular features of this basic work of the Station include the demonstration of the distinctive characteristics of the soil of semi-arid climates as manifested in California, including unique discoveries of the operation of soil organisms; demonstration of the value and ultilization of alkali lands through proper reclamation methods; also demonstrations bearing on the economical use of water and the development of better methods of the application of water in orchard and vineyard practice. In the field crops there has been demonstration of improved methods of culture, together with the production of improved varieties or select strains of cereals, which are a basis for building up vastly increased production.

It is difficult to express properly the wide influence that has been exerted by the experts of the College of Agriculture on horticultural practice not only in this state, but elsewhere in the United States, and also in the most remote countries of the world where the California form of fruit tree is now recognized as embodying peculiarly desirable characteristics. The work has also been unique in having a station devoted exclusively to the investigation of the culture of citrus fruits and in the fact that in California has been found the only College of Agriculture in America having a distinct department for the study of the grape and its products.

Among the many definite acts of service to the producers of the State, foremost in the field of plant disease control should be mentioned the control of the asparagus rust, the discovery of the cause and control of the Brown Rot of citrus fruit,—a

Budd Hall is devoted to instruction and research in soils, field crops, agricultural chemistry, animal and human nutrition, veterinary science and agricultural education. Office of irrigation investigations and seed testing laboratory of the United States Department of Agriculture are located in this building.

disease new to science and horticulture before its appearance in southern California about seven years ago. The maintenance of special laboratories and fields for the study of plant diseases has been a constant defense against these serious sources of loss to plant growers.

Certain methods of control of injurious insects have been developed by the Station, which have been adopted generally not only throughout California, but also in other states and, in some instances, even in other countries.

California was the first state to provide *effective* legislation for the control of the chemical composition of insecticides, which was based upon the work of the California station, and is now in wide and beneficent operation.

Metabolism experiments with nuts and fruits as human food have clearly demonstrated the great value of these elements of human diet. Execution of state laws controlling the purity of the food of the people has been made possible through co-operation between this Experiment Station and the State Board of Health. Based upon the work of the station the Legislature has also provided for the control of hog cholera by the manufacture and distribution of immunizing serum to all parts of the state.

CENTERS OF THE COLLEGE OF AGRICULTURE IN CALIFORNIA

To further the aims of the College of Agriculture there have been established certain important centers of activity in various portions of the State where the work of the College of Agriculture may be developed, and from which it may ramify. These centers are at present at follows:

COLLEGE OF AGRICULTURE AND EXPERIMENT STATION AT BERKELEY

A battalion drill of University students is an inspiring sight.

The headquarters for the activities of the College of Agriculture and Experiment Station are located on the Campus of the University of California, and in addition to a modern white granite structure (see frontispiece) to house the horticultural, entomological, plant pathological and irrigation departments and administrative offices includes Budd Hall, in which the cereal, agricultural chemical, veterinary and soils work are taken care of, and the Fertilizer Control Building, in which the State Fertilizer Control Laboratory and the State Food and Drug laboratories are housed. The laboratories in all of these structures are being enlarged and refitted for the use of as large a number of students as possible and to take care of the large increase in enrollment which follows from year to year.

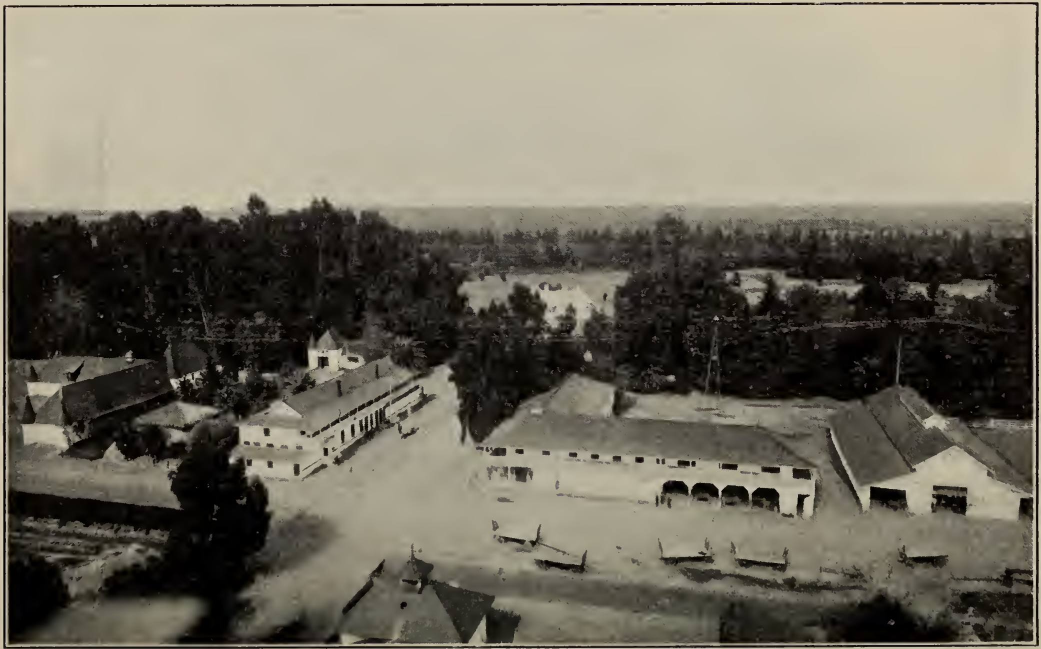
Fertilizer Control and Pure Food Laboratories.

UNIVERSITY FARM

This farm, which was purchased in accordance with a California statute of 1905, comprises 779 acres of fine alluvial soil and is situated at Davis, Yolo County. The farm is provided with adequate buildings for instruction in practical agriculture and horticulture, including a commercial creamery, stock pavilion, horticultural building, dairy barn, horse barn, cereal building, mechanical shops, poultry building, two dormitories and one dining hall. Full provision is made for instruction to farm school students and to short course students during the limited portions of the year, as stated elsewhere in this Prospectus.

The water supply at the University Farm is obtained from deep wells.

Entrance to the Kearney Estate—"At Fresno, where the University owns 5,400 acres of land, there is an opportunity to build up the most extensive, most varied, and best instruction in horticulture, both for farm school and University, that is to be found in the world. No other such possibility is to be found anywhere."—**Dean Hunt.**



The Kearney Ranch—"We have with all this variety of equipment and location the opportunity to develop in California the completest and richest system of agricultural education and research that the world has yet seen."—President Wheeler.

KEARNEY PARK

The Kearney Estate, which was bequeathed to the University of California by M. Theodore Kearney, comprises 5400 acres of land on which are situated extensive vineyards, orchards, and alfalfa ranches. A small portion of this ranch is used for experimental purposes, otherwise it is managed wholly as a commercial enterprise. Students specializing in pomology may do their required summer work there. It is a part of the plan of the Board of Regents to make this estate contribute to the most extensive and varied instruction in horticulture that has ever been attempted.

CITRUS EXPERIMENT STATION

The Citrus Experiment Station at Riverside serves as a center for the study of the citrus industry and other problems arising wherever agriculture is conducted by irrigation. This will also be the center for graduate instruction in tropical agriculture and for summer instruction for University students who are specializing in citrus culture.

IMPERIAL EXPERIMENT STATION

The Experiment Station at El Centro, Imperial County, comprises about 40 acres of land on which experiments relating to the growing of vines, cotton, and cereals, as well as other crops which may be suited to the Imperial Valley, are conducted. The Experiment Station is equipped with a small laboratory, office and library, and out buildings for farm stock and farm machinery.

PLANT PATHOLOGICAL LABORATORY

This substation at Whittier, Los Angeles County, was provided for by the Legislature of 1905, and includes a large and well equipped laboratory building, in which research work is carried on which bears on the nature and control of plant diseases affecting fruits and vegetables. Entomological, plant pathological, and chemical laboratories are included.

FORESTRY STATIONS

The two Forestry Stations, at Santa Monica and Chico respectively, on which forestry problems are studied by the University, were transferred to the University by the Legislature in 1893. Problems relating to forest growth, species of trees best available for foresting otherwise unused land, and other problems relating to forestry are here worked out.

CO-OPERATIVE EXPERIMENTS

In order to reach as large a portion of the State as possible in the experimental work of the College of Agriculture, the efforts of the latter are not confined to the numerous substations, but also include experiments in co-operation with agriculturists and horticulturists in this State looking toward the solution of problems for more limited areas of California. Some of these are carried on by several divisions within the Department of Agriculture, and include short term experiments which are frequently of great practical value.

The Sather Memorial Gate ornaments the Telegraph Avenue entrance to the Campus of the University of California.

UNIVERSITY COURSE IN THE COLLEGE OF AGRICULTURE

ADMISSION

The various methods of admission are the same as for any other college of the University of California, viz.: by examination; by recommendation from accredited schools in California; on normal school and teachers' diplomas; on credentials from schools outside California. For information concerning any of these methods consult the *Circular of Information of the Academic Colleges,* 1912–13, pages 75–85.[1]

The minimum requirements for admission, in terms of high school work, are: English, 2 years, 6 units; foreign language, 2 years, 6 units; foreign language, intermediate mathematics, advanced mathematics, third-year or fourth-year science—in any combination—2 years, 6 units; U. S. history and civics, 1 year, 3 units; mathematics, 2 years, 6 units; natural science, 1 year, 3 units; electives, 15 units. Total, 45 units.

The required fundamental studies must be completed before the Junior Certificate will be granted. This is the work of the preparatory school and the lower division in the University. Upon completion of this required work the student receives the Junior Certificate, which entitles him to elect the remainder of his undergraduate courses, providing he arrange his studies so as to show an amount of properly correlated, advanced work sufficient to satisfy the general requirement for graduation from the College of Agriculture.

Preparatory students who intend to enter the College of Agriculture should familiarize themselves with the requirements for the Junior Certificate in that College, since the work of an accredited high school is really supplementary to that of the Lower Division. For example, four years of English in an accredited high school completes the total requirement in English for the Junior Certificate. In the same way the student may complete the Junior Certificate requirements in mathematics, foreign languages, or history. In other words, a student who presents excess matriculation credit of approved grade *in any prescribed subject* thereby reduces the amount of work required of him in that subject in the University and earns the privilege of substituting *elective courses* in making up the sixty-four units of work required for the Junior Certificate. This arrangement does not lessen the amount of work to be done, but it does give an opportunity to take more courses in agriculture, for example, than would otherwise be possible in the Lower Division. It makes possible broader preparation in natural sciences, foreign languages, or economics.

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[1] Sent free upon application to Recorder of the Faculties, University of California, Berkeley.

The present botanical garden terminates at the walk leading to the Mechanics Building, in which instruction in wood and iron working and in mechanical engineering is given.

SUMMARY OF REQUIREMENTS FOR THE JUNIOR CERTIFICATE INCLUDING REQUIREMENTS FOR MATRICULATION[2]

(The requirements are stated in ''units''; in the University a unit signifies one hour per week of recitation or lecture with preparation therefor, during one half-year. A course of study taken in the preparatory school for one year at five periods per week is valued at three units. The number of units indicated below for each subject under the head of Junior Certificate represents the normal amount of work done in the lower division of the University.)

Subject	Matriculation	Junior Certificate
English	6	12
Greek, Latin, German, French, Spanish or Italian	6	18
Foreign Language, Intermediate Mathematics, Advanced Mathematics, third-year or fourth-year Science—in any combination	6	....
History or Economics	3	9
Mathematics	6	12
Natural Science	3	18
Military Science, Physical Culture, Hygiene	....	9
Agriculture	....	12
Elective	15	19
Total	45	109

The Junior Certificate is required of all regular students in the College of Agriculture. The certificate must be obtained in advance of the last two years of residence. Until the certificate has been obtained the student is classed in the Lower Division.

WORK OF THE LOWER DIVISION

General Requirements

(1) That portion of the 18 units of Natural Science required for the Junior Certificate, which is done at the University, shall be chosen from the following fundamental subjects:

General Botany, General Chemistry, General Zoology, General Physics, Elementary Bacteriology, Introductory Physiology.

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[2] For the full description of matriculation subjects and other details concerning University instruction see Circular of Information concerning the Academic Colleges. Sent free upon request by the Recorder of the Faculties, University of California, Berkeley.

(2) The 12 units of Agriculture required for the Junior Certificate shall consist of the following subjects:

Agricultural Chemistry;
Soils;
Plant Propagation;
Principles of Plant and Animal Breeding.

(3) Courses of instruction should be chosen primarily with reference to the major subjects. Suggested four-year courses will be furnished by the instructors in charge of the major subjects. Beginning with his sophomore year, the student will indicate on his study-list card, each half-year, the number (as given below) of the major subject or subjects which he proposes to study. For a clear understanding of what studies the major subjects include the student should consult the Upper Division courses of study outlined for the various major subjects on pages 31 to 71. The major subjects in Agriculture are as follows:

I. Agricultural Education.
II. Agronomy.
III. Pomology.
IV. Citriculture.
V. Floriculture and Landscape Gardening.
VI. Viticulture and Enology.
VII. Soils and Fertilizers.
VIII. Nutrition.
IX. Agricultural Chemistry.
X. Animal Husbandry and Veterinary Science.
XI. Poultry Husbandry.
XII. Dairy Industry.
XIII. Insecticides and Insect Biology.
XIV. Parasitology.
XV. Plant Pathology.
XVI. Irrigation.

While not essential for the Junior Cerificate, the following work is required as prerequisite to the major subjects as listed above:

Economic Botany and Principles of Economics for I, II, III, IV, V, and VI*a*.

Gravimetric and Volumetric Analysis for VI*b*, VII, VIII and IX.

General Zoology, Introductory Physiology and Elementary Bacteriology for X.

General Zoology and Introductory Physiology for XI.

Elementary Bacteriology and Gravimetric and Volumetric Analysis for XII.

Insect Biology for XIII.

General Zoology, Elementary Bacteriology and Parasitology 1 and 2 for XIV.

General Cryptogamic Botany (first half-year) for XV.

General Physics (2A-2B), Elements of Analysis, and Surveying for XVI.

(4) All students before graduation must complete the following:

Botany 2 and 3, 2 semesters.

Zoology 1, 1 semester.

Chemistry 1A-1B and 3A-3B, 2 semesters in each.

Physics 2A, 1 semester.

Pathology 1 (Bacteriology), 1 semester.

Geology 1A or Physical Geography 1A, 1 semester.

[3]Drawing C (Instrumental Drawing), 1 semester.

[3]Mathematics C (Trigonometry), 1 semester.

Summer class in special work connected with proposed major subject. This course is eight weeks in length; 6 units credit. Fee, $20. Prerequisite: Completion of two years' study in a university or college course.

Hearst Memorial Mining Building was provided by Mrs. Phoebe A. Hearst, the University's chief benefactress. The botanical museum and library, and the herbarium, containing nearly 200,000 sheets of mounted specimens, are installed in the third story.

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[3] Not required of students having matriculation credit in these subjects.

GENERAL GUIDE FOR STUDENTS IN THE LOWER DIVISION

Note.—For detailed descriptions of the various courses referred to by number in this prospectus consult the Announcement of Courses of the University, Circular no. 2, as listed on second page of cover.

Freshman

First Half-year

Botany 2 (General Botany)	3
Chemistry 1 and 3 (Inorganic Chemistry and Qualitative Analysis)	5
[4]Foreign Language	3
[5]English 1A (General Composition)	3
Military Science, Physical Culture, Hygiene	4½
	18½

Second Half-year

Botany 3 (General Botany)	3
Chemistry 1 and 3 (Inorganic Chemistry and Qualitative Analysis)	5
[4]Foreign Language	3
[6]Mathematics	2 or 3
[7]History or Economics	3
Military Science, Physical Culture	2
	18 or 19

Sophomore

First Half-year

Agricultural Chemistry 1	3
Geology 1A, or Physical Geography 1A	3
Zoology 1A (General Zoology)	4
[8]Drawing C	1
[9]Foreign Language (or [10]Elective)	3
Bacteriology (Pathology 1)	3
Military	½
	17½

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[4] Required of all who enter with less than 18 units credit in foreign languages. German or French generally advised.

[5] Required of all who enter with less than 12 units credit in English.

[6] Required of all who enter with less than 12 units of Mathematics; Course C required of all who enter without credit in Trigonometry or who do not take Mathematics 1A-1B.

[7] Required of all who enter with less than 9 units credit in History. Principles of Economics prerequisite to major subjects I, II, III, IV, V, and VI A.

[8] Required of all without credit in matriculation subject 17.

[9] Required only to complete the 18 units necessary for the Junior Certificate, but see Upper Division requirements in Viticulture, Plant Pathology, Soils, etc.

[10] Chemistry 5A is prerequisite to certain Upper Division courses in Soils, Nutrition, etc. See also prerequisites to major subjects X, XI, XIII, XIV, and XVI.

Second Half-year

Soil Technology 1	3
Plant Propagation (Horticulture 1)	3
Principles of Breeding (Breeding 19)	3
Physics 2A (General Physics)	3
Foreign Language (or Elective)	3
Military	1
	16

SUMMER COURSE

Special work connected with proposed major subject to be taken at the close of the sophomore year. This course is eight weeks in length. Work is carried on as far as possible, just as in actual practice; 6 units credit. The fee in this course is twenty dollars. Prerequisite: Completion of two years of study in a university or college course.

WORK OF THE UPPER DIVISION

Regular students will have chosen the major subject or subjects in which they wish to specialize during the sophomore year. The Upper Division work must be extended over a period of two years of residence. Not more than 16 units may be taken during any one half-year when in residence at Berkeley. Among the sixty units of work normally taken, there must be thirty-six units in *major courses* (courses numbered 100 or higher), as follows:

Major subject	10
Thesis in major subject	4
Courses correlated with major subject	10
Agriculture (any subdepartments)	12

The work of the Upper Division shall be carried on under the direction of the head of the division in which the major subject is taken and all junior and senior study lists shall be approved by him before presentation for signature by the Dean.

Thesis work will be arranged with an instructor in the major subject. The student will submit his plan of thesis work to the Dean of the College at the beginning of his senior year and upon approval by the Dean shall file his thesis card with the Secretary. For further procedure follow rules 2–8 inclusive, as stated in the Announcement of Courses. One hundred and thirty units are required for graduation.

UPPER DIVISION COURSES OF STUDY ARRANGED BY MAJOR SUBJECTS

Explanatory Note.—The introductory remarks, preceding each Upper Division course of study, deal mainly with the work of instruction in the respective subjects. In some cases, however, reference is made to investigational work, which is to some extent related to advanced instruction. *Regarding electives,* it is generally recommended that in each half-year the student elect at least 2 or 3 units of work in the humanities, e.g., English literature, education, history, sociology. It should be understood that these Upper Division study lists are not prescribed; they have been prepared by the divisions respectively concerned and are offered as guides for students wishing to specialize in the various subjects.

AGRICULTURAL EDUCATION

The department of agricultural education at present offers instruction in seven courses, which, accompanying instruction in technical agriculture, are intended to prepare students for efficient agricultural teaching in secondary schools of both normal and high school rank and for supervision of agricultural work in elementary schools.

These courses include study of the materials and methods adapted to agricultural instruction in secondary and elementary schools, accompanied by carefully supervised practice work; a special course dealing with the place and function of the high school farm and garden, together with practice in planning and executing problems and demonstrations out of doors; study of special methods to be employed in the teaching of general science and first-year agriculture; and a course in school ground decoration.

In addition, special summer courses are given each year to suit the needs of teachers already in service but desiring professional improvement.

It is planned to add, as soon as possible, other desirable courses, such as the history of industrial education, with particular reference to agriculture; the making of community social surveys and the carrying on of local community or extension work; and a general course in agricultural pedagogy, adapted especially to the needs of students preparing to teach agriculture in special agricultural schools or in college.

TEACHER'S CERTIFICATE

For the recommendation of the department for either a special certificate or the regular state certificate the following requirements must be met:

I. That the applicant, if a graduate of the University of California in 1914 or thereafter, shall have taken his major in Agricultural Education.

II. That the applicant shall have had the following work or the equivalent:

(*a*) Agricultural Education 101, 102, 104.

(*b*) At least one course in Soils, Economic Botany, Pomology, Agronomy, Landscape Gardening, Plant Pathology, Economic Entomology, Farm Management, Live Stock, Dairying, Poultry, Veterinary Science, Farm Machinery, Irrigation.

COURSE OF STUDY

Summer course in some other major subject must precede Upper Division work.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign language: A reading knowledge of either French or German required; German advised.

Recommended electives: Agricultural Education 1 in Lower Division. At least one course in irrigation, field crops, nutrition, and landscape gardening. Physical Geography 2.

JUNIOR

First Half-year		*Second Half-year*	
		At University Farm, Davis	
Economic Botany	3	Live Stock	
Agricultural Education 101	3	Dairying	
Irrigation 3	2	Poultry	
Pomology 101	3	Veterinary Science	
Economic Entomology 16	2	Farm Machinery	
Elective	3		
	16		19

SENIOR

First Half-year		*Second Half-year*	
Education 105A	3	Education 105B	3
Agricultural Education 102	3	Agricultural Education 104	3
Farm Management	2	Plant Pathology 121	2
Botany 105A	3	Thesis	2
Thesis	2	Elective	6
Elective	3		16
	16		

AGRONOMY

Alfalfa helps to pay expenses at Kearney Park.

The instruction outlined for specialists in agronomy is such as will insure to the graduate a thorough knowledge of field crops of California, including the grains, forage crops, and such others as sugar beets, a good working knowledge of the chemistry of the subject, and training in the methods of conducting research in the production of cereals and other field crops; a knowledge of selection of selection in cereals for the production of the best paying varieties, a knowledge of industrial processes related to field crops particularly, a knowledge of the milling industry, the production of sugar from beets, and the care and disposition of forage crops. Laboratories are provided at Berkeley for experimental work on the chemical side of the subject and to some extent on the industrial side. Provision is made for work at the University Farm during certain portions of the course which will include field practice in crop improvement, plotting of experiments, and interpretation of results.

The training thus outlined, especially if taken in conjunction with advanced work in soils, is calculated to fit the graduate, and particularly such graduates as return to the University for a year or more of graduate work, for government positions in the United States Department of Agriculture, positions in agronomy, soils, and for crop investigations, as well as for work in field experiments on crops and soil fertility at the State Experiment Stations. The training in agronomy also opens up to its recipients the field of practical agriculture in the management of large estates, the superintendence of large grain ranches, work in connection with beet sugar factories, either in a chemical or industrial way, and work in connection with textile industries.

COURSE OF STUDY

Summer course at the University Farm must precede Upper Division work.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign language: A reading knowledge of German or French required; German advised.

Recommended electives: All Lower Division courses in field and forage crops.

JUNIOR

First Half-year

Economic Botany	3
Irrigation 3	2
Agricultural Education 101	3
Botany 105A	3
Economic Entomology 16	2
Elective	3
	16

Second Half-year

Agronomy	3
Farm Management	2
Breeding 120	3
Plant Pathology 121	2
Soil Technology 101	3
Elective	3
	16

SENIOR

First Half-year

Agronomy	3
Farm Management	3
Veterinary Science	2
Thesis	2
Elective	6
	16

Second Half-year

At University Farm, Davis

Agronomy	
Farm Machinery	
Live Stock	
Dairying or Poultry	
Thesis	2
	19

POMOLOGY

At present certain courses of instruction which deal with general principles and practices are listed in the Announcement of Courses under the Head of Horticulture. These treat particularly of plant propagation and fruit culture in California.

Class of students pruning for pear blight

The courses in pomology will offer thorough instruction and training in both the technical and the practical aspects of the subject—classification, comparison, selection and production of orchard fruits, orchard management, fruit transportation, handling and marketing, and systematic pomology. Some of the practice work will be done at the University substations at Fresno, Riverside, and Davis, and at other points where special arrangements can be made.

Besides instruction in citriculture and subtropical pomology, work is offered in advanced pomology, in which attention will be given to special phases of the subject.

Twenty years ago the Kearney Estate was a naked plain. Now there is a 250-acre park, which is self-supporting.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign languages: A reading knowledge of French or German required; both are advised.

Recommended electives: Sub-tropical Pomology, Surveying (C. E. 1), Physical Geography 2, Botany 104, 109.

JUNIOR

First Half-year		*Second Half-year*	
Pomology 101	3	Pomology 102	4
Botany 105A	3	Pomology 105	1 or 2
Plant Pathology 2	2	Plant Pathology 121	2
Insect Biology 13	2	Soil Technology 101	3
Soils 121	2	Irrigation (general course)	3
Elective	4	Elective	2
	16		15 or 16

SENIOR

First Half-year	
Pomology 103	2
Pomology 105	1 or 2
Pomology 104	3
Citriculture	3
Irrigation 3	2
Thesis	2
Elective	2
	15 or 16

Second Half-year	
Thesis	2

(The general plan for this half-year is to send the students specializing in Pomology to Fresno or other places where special facilities for advanced instruction are available.)

CITRICULTURE AND SEMITROPICAL FRUITS

Instruction given in Citriculture at Berkeley includes lectures and laboratory work covering all phases of the citrus industries of the world and of citrus production in California in particular. Knowledge of the fundamental sciences gained in Lower Division work is here applied specifically to the production and marketing of citrus fruits. Practice work, which is adaptable to the laboratory, such as the systematic study of species and varieties, morphology of the fruits and other plant parts, root stocks, budding, etc., will be given at Berkeley. Practice work in land judging, planting, pruning, picking, packing, etc., will be given at the University substations at Riverside, Whittier, Fresno, or in large commercial orchards wherever special arrangements can be made.

Citrus Experiment Station at Riverside has been organized with laboratories to study the problems arising wherever agriculture is conducted under an irrigation ditch.

Instruction in semitropical and tropical fruits, including the date, olive, avocado, guava, loquat, mango and others, will be given by lectures, laboratory and field practice in a manner similar to that outlined above for citriculture.

The aim of the department is to equip its graduates with the knowledge and practice required to successfully prepare, plant, and operate citrus orchards and plantations of semi-tropical fruits on a commercial scale. Graduates entering the industry will continue to receive all possible assistance in solving any special problems which may arise. Those intending to teach in high schools or colleges or enter experiment station work are advised to pursue one or more years of graduate study.

COURSE OF STUDY

Summer course preceding major subject to be arranged.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign language: A reading knowledge of French, German, and Italian advised; at least French or German required.

Recommended electives: Physical Geography 2, Surveying (C. E. 1), Botany 109.

JUNIOR

First Half-year		*Second Half-year*	
Economic Botany	3	Pomology 101	3
Botany 105A	3	Plant Pathology 121	2
Plant Pathology 2	2	Horticulture 12 or Soil Technology 101	3
Insecticides 16	2	Irrigation 5	3
Farm Management	2	Insecticides 124	2
Elective	4	Elective	3
	16		16

SENIOR

First Half-year		*Second Half-year* *At Citrus Experiment Station*	
Citriculture	3	Thesis	2
Sub-tropical Pomology	2	To be arranged	14
Irrigation 3	2		
Thesis	2		
Elective	7		
	16		16

LANDSCAPE GARDENING AND FLORICULTURE

The botanical garden is an interesting and instructive feature of the University campus.

The course in Landscape Gardening is designed, first, to offer professional instruction both theoretical and practical to those who desire to become either successful practitioners of the art, competent office assistants, or reliable superintendents of construction; and second, to furnish instruction of an untechnical nature that will enable others to become familiar with the fundamental principles governing the art to the extent that they may be appreciative of correct design and all that is beautiful in nature.

While the course offers opportunity to specialize in landscape gardening, subjects common to all courses in the College of Agriculture are considered fundamental and preparatory for those of a more highly specialized character to follow. Students intending to major in landscape gardening should consult freely and as early in their course as possible with the instructor in charge, in order that proper electives may be determined to meet the requirements of the individual.

The course in Floriculture is designed to furnish theoretical and practical instruction to those who intend to become eventually wholesale or retail commercial growers of cut flowers and potted plants, competent florists on private estates or in public parks. As facilities permit students will be allowed to specialize in the growing of certain crops, store management, including artistic design and decoration, or other phases of commercial or practical floriculture. To this end proper electives should be chosen in consultation with the instructor.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign language: A reading knowledge of both French and German advised; at least one is required.

JUNIOR

First Half-year		*Second Half-year*	
Economic Botany	3	Botany 104B	3
Botany 104A	3	Irrigation 5 or Soil Technology 101	3
Drawing 2A	3	Drawing 2B	3
Plant Pathology 2	2	Floriculture 101	3
Elective	4	Elective	4
	16		16

SENIOR

First Half-year		*Second Half-year*	
Landscape Gardening 101	3	Landscape Gardening	3
Architecture 101A	3	Architecture 101B	3
Architecture 106A	1	Architecture 106B	1
Botany 105A	3	Plant Pathology 121	2
Economic Entomology 16	2	Thesis	2
Thesis	2	Elective	5
Elective	2		16
	16		

The Rose Garden in Kearney Park contains 500 varieties.

VITICULTURE AND ENOLOGY

The growing of grapes and the industries based thereon are in a peculiar sense Californian, and California is the only state in the Union which possesses a special department of Viticulture and Enology. Instruction in these subjects is given to regular and special students at Berkeley by means of courses of lectures on grape growing, wine making and technical zymology, supplemented by laboratory courses in the chemical and physical examination of vines and vineyard products, and in the preparation and use of yeasts.

The experimental vineyard at the University Farm, Davis, contains fifty acres. The University also cultivates about 700 acres of raisin grapes on the Kearney Estate, Fresno.

The aim of these courses is to prepare students to become efficient managers of vineyards, cellars and packing houses or educators and specialists in the various viticultural and fermentative industries.

At Davis, appropriate instruction in grape growing is given to farm students and short practical courses to University students and farmers.

At suitable points throughout the State instruction is given to those actually engaged in the industries by means of institute lectures and vineyard and cellar demonstrations in co-operation with the Department of Extension in Agriculture.

The work of investigation is carried out at Davis, Kearney, and Imperial in special experiment vineyards; at Berkeley in the viticultural and zymological laboratories and at various points where special problems can be most effectively attacked.

COURSE OF STUDY

A. VITICULTURE

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Economic Botany and Principles of Economics.

Foreign languages: A reading knowledge of French, German, and Italian advised; either French or German is required.

Recommended electives: Italian 1A-1B, Botany 1A-1B, Insect Biology 1, Horticulture 14, Viticulture 115, 122, Agronomy, Agricultural Education, Education 105.

JUNIOR

First Half-year		*Second Half-year*	
Economic Botany	3	Viticulture 16	3
Botany 105A	3	Plant Pathology 121	2
Insect Biology 13	2	Pomology 101	3
Plant Pathology 121	2	Irrigation 5 or Soil Technology 101	3
Farm Management	2	Elective	5
Elective	4		
	16		16

SENIOR

First Half-year		*Second Half-year*	
Viticulture and Enology 114	3	Viticulture 117	2
Insect Biology 121A	2	Soils and Fertilizers 124	1
Insecticides 16	2	Horticulture 12	3
Agriculture 102	1	Thesis	2
Irrigation 3	2	Elective	8
Insecticides 119	1		16
Thesis	2		
Elective	3		
	16		

COURSE OF STUDY

B. ENOLOGY

Summer course preceding Upper Division is to be arranged.

Prerequisite to major subject: Gravimetric and Volumetric Analysis.

Foreign language: A reading knowledge of both French and German advised; either French or German is required.

Recommended electives: Botany 1A-1B, Physics 3A-3B, Horticulture 12, Plant Pathology 2, 121, Pomology 101, Agronomy, Agricultural Education.

JUNIOR

First Half-year		*Second Half-year*	
Chemistry 5A	3	Viticulture 16	3
Botany 105A	3	Viticulture and Enology 112	2
Nutrition 2	2	Soils and Fertilizers 123	3
Chemistry 8A	2	Chemistry 8B	2
Viticulture and Enology 121	3	Chemistry 8C	2
Elective	3	Elective	4
	16		16

SENIOR

First Half-year		*Second Half-year*	
Viticulture and Enology 114	3	Viticulture and Enology 116	2
Viticulture and Enology 115	4	Viticulture and Enology 117	2
Viticulture and Enology 122	2	Viticulture and Enology 123	3
Thesis	2	Soils and Fertilizers 124	2
Elective	5	Thesis	2
	16	Elective	5
			16

SOILS AND FERTILIZERS

As the curriculum for specialists in soils and soil fertility indicates, the training given will consist of comprehensive courses on what experience has shown to be the most essential phases of the subject. A thorough grounding on the characteristics of soils as regards their texture, chemical composition, and bacteriological characters will be given and a correlation between these factors and plant nutrition emphasized. To that end there will be given not only laboratory work in a specialized way bearing on soil physics, soil chemistry, soil bacteriology, the nature of fertilizers, and plant physiology, but additional work in the field on which much emphasis is to be placed and will take up soil surveys and the study of soil types, as well as methods of tillage and a study of farm machinery. The training as thus outlined will be a thorough preparation for soil fertility and agronomy work in their more specialized phases.

With the education given to those specializing in soils and fertilizers, the graduate will be prepared to do professional work in soils in the government service or in the service of state universities and colleges and state experiment stations in the fields of agronomy, soils, soil fertility, and fertilizers. For those desiring to specialize for either government or state service, and particularly for research work in such service, at least one year of graduate work for which facilities are amply provided is strongly urged.

Every encouragement will be offered to those desiring to pursue postgraduate studies on problems in soils and soil fertility.

COURSE OF STUDY

Summer course in *Soil Surveying* must precede Upper Division work.

Prerequisite to major subject: Bacteriology and Gravimetric and Volumetric Analysis.

Foreign language: A reading knowledge of both German and French required. Thorough training in German, technical prose or equivalent. One year of French.

Recommended electives: Mineralogy 1A-1B, Economic Botany, Insect Biology, courses on field and forage crops.

JUNIOR

First Half-year		*Second Half-year*	
Soil Chemistry 122	3	Soil Bacteriology 123	3
Pomology 101	3	Soils Pro-seminar 126	1
Soils Pro-seminar 126	1	Soil Technology 101	3
Agronomy (crop experiments)	3	Irrigation 5	3
Elective	6	Elective	6
	16		16

(Summer course in farm machinery and tillage methods at University Farm, Davis, strongly urged.)

SENIOR

First Half-year		*Second Half-year*	
Soil Investigation 127	3	Soil Investigation (Thesis)	4
Investigation of Fertilizers 125	2	Irrigation 4 (Drainage)	2
Soils Pro-seminar 126	1	Chemistry of Fertilizers 124	2
Irrigation 3	2	Soils Pro-seminar 126	1
Plant Pathology 2	2	Citriculture 101	3
Elective	6	Elective	4
	16		16

NUTRITION

Instruction is offered in both animal and human nutrition in the form of lectures, recitations, and laboratory exercises in both Upper and Lower Division courses.

Animal Nutrition.—The object of the general lecture course is to familiarize the student with the fundamental principles of nutrition, the needs of the animal body, and the most effective and economical methods of supplying these needs in relation to the purpose for which the animal is reared and kept. This knowledge is highly essential to those electing animal and poultry husbandry.

Shorthorns—High class types of several breeds are maintained as laboratory material for students.

The laboratory offers opportunity for the student to acquire facility in making analyses of cattle foods and performing experiments that have practical as well as scientific interest.

Human Nutrition.—The object of the lecture course is to give the student a thorough knowledge of the principles of human nutrition, the process of digestion and metabolism, the chemical composition of foods, and their relation to the needs of the body. The methods are also considered of applying these principles to daily life and the methods of constructing dietaries for individuals and groups forms a large part of the advanced work. This is in line with the modern effort at the conservation of human life. Additional work is offered for the student specializing in Home Economics.

The laboratory work gives facilities both to those who wish simply to become familiar with the ordinary tests for foods, adulterants, etc., and also for those desiring to train as food or sanitary chemists.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Gravimteric and Volumetric Analysis.

Foreign language: A reading knowledge of German or French is required.

Recommended electives: Nutrition 2 and Chemistry 8A-8B in Lower Division. Courses in Physiology and Hygiene.

JUNIOR

First Half-year	
Nutrition 2	2
Nutrition—General Principles	3
Nutrition—Laboratory	3
Agronomy (Crop Production)	3
Elective	5
	16

Second Half-year

(a) At Berkeley—Specializing in Human Nutrition

Feeding of Animals	2
Feeding of Humans	2
Food Analysis	3
Agricultural Chemistry Lab.	3
Elective	6
	16

(b) At Davis—Specializing in Animal Nutrition

Live Stock and Poultry	4
Dairy Practice	4
Crop Production	4
Farm Mechanics	3
Veterinary Science	3
	18

SENIOR

First Half-year		*Second Half-year*	
Nutrition: Metabolism, Lect.	2	Nutrition: Metabolism, Lect.	2
Nutrition: Metabolism, Lab.	3	Nutrition: Metabolism, Lab.	3
Comparative Anatomy	3	Thesis	2
Parasitology	3	Elective	9
Thesis	2		16
Elective	3		
	16		

AGRICULTURAL CHEMISTRY

Opportunity is offered for students who wish to prepare themselves as teachers of Agricultural Chemistry or who wish to enter that broad field of investigational work where a knowledge of the relations of Chemistry to Agriculture is essential. Special attention will be given to the preparation of food and fertilizer analysts. The Fertilizer Control laboratory, the Insecticide Control laboratory and the State Pure Food laboratory are located at the University. The instruction in Agricultural Chemistry at present consists of advanced laboratory work in analysis of water, insecticides and various agricultural materials and products. A thorough general course in the principles of Agricultural Chemistry will be required of all students in the Lower Division.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Gravimetric and Volumetric Analysis.

Foreign language: A reading knowledge of French or German is required; German advised.

Recommended electives: Food Analysis, Nutrition 2, Chemistry of Fertilizers.

JUNIOR

First Half-year		*Second Half-year*	
Agricultural Chemistry 121A	4	Agricultural Chemistry 121B	4
Soil Chemistry 122	3	Agronomy	3
Economic Botany	3	Chemistry 8B	2
Chemistry 8A	2	Chemistry 8C	2
Elective	4	Elective	5
	16		16

SENIOR

First Half-year		*Second Half-year*	
Investigation (Thesis)	2	Investigation (Thesis)	2
Nutrition, Metabolism	5	Nutrition, Lect. and Lab.	5
Chemistry 109A	3	Chemistry 109B	3
Chemistry 110A	3	Chemistry 110B	2
Elective	3	Elective	4
	16		16

ANIMAL HUSBANDRY

The Berkshire is one of four breeds of swine maintained at the University Farm. Other breeds are Poland-China, Duroc Jersey and Tamworth. Feeding experiments upon the economy of productions are being conducted.

Instruction.—The instruction offered in Animal Husbandry includes lectures and laboratory work relating to the judging, feeding, breeding and management of all classes of farm live stock. The courses are intended to develop a liking for the better types of farm animals and to qualify the student for intelligent work in rearing and handling live stock. Unless young men have had considerable experience they cannot expect to be qualified for positions as managers of stock farms or ranches at the time of their graduation. Those wishing to engage in such work are advised to first spend some time in working with stock. Those who desire to become teachers of Animal Husbandry or experiment station workers should plan for a fifth year of post-graduate study.

Because success in all work with farm animals rests upon the ability to select wisely, the first work given is judging. For these classes the animals are brought into the class room and the student is required to criticize them according to the standards explained in lectures and upon the score cards. After a fair working knowledge of the essentials to greater value has been acquired for each of the classes of stock, the principles of breeding and of feeding are taken up. These subjects are covered in large part by lectures, but there is practice work in calculating rations to accord with the most recent scientific ideas and also in studying blood lines and inheritances by use of the records of the various breeders' associations.

For such work there is maintained at the farm representative herds numbering over one hundred head of Jersey, Holstein, Shorthorn, Hereford and Angus cattle. These animals are used freely in the judging classes and their feeding and management exemplifies the instruction given in the class room. Percheron and Shire horses are also owned by the University Farm and a few types of roadster and saddle horses. In the flocks of Shropshire, Southdown and Hampshire sheep there are usually about twenty ewes of each breed besides lambs and stud rams. It is planned to add a fair sized flock of fine wool sheep. Berkshire, Poland China, Duroc and Tamworth swine are similarly represented and their feeding and management is along the lines of what will be found to be economical farm practice.

Teake Lyons III produced in nine months 21,982 pounds of milk containing 738 pounds of butter fat. During the period, this cow ran with and was handled in the same manner as the rest of the herd.

In judging and in the study of management, classes are conducted to a number of nearby dairy and stock farms and breeding establishments.

The investigations along Animal Husbandry lines relate mainly to systems of management for economy of production of milk, beef, pork and mutton. The general plan calls for the recording of the feed consumed by each individual young animal reared in the breeding herds. By this means it will be possible to direct selection to develop the characters that contribute to the highest efficiency in the utilization of the common feeds under California conditions. Tests are also planned and conducted to show the relative values of rations made up of various feeds in such combinations as are most likely to be of interest to stock raisers. During the progress of such experiments students are given opportunity to become familiar with what is being done and in some cases to assist in the work.

The Shropshire is one of the three breeds of sheep maintained at the University Farm. A Southdown lamb bred at the Farm won first at the International at Chicago.

COURSE OF STUDY

Summer course including livestock husbandry and practice in surveying must precede Upper Division.

Prerequisite to major subject: General Zoology, Elementary Bacteriology, Introductory Physiology.

Foreign language: A reading knowledge of German or French is required.

Recommended electives: Physiology 1 in Lower Division, courses in Nutrition, Zoology, Economic Botany, Farm Management, Agricultural Education.

JUNIOR

First Half-year	
Physiology 1	4
Agronomy	3
Irrigation 3	2
Comparative Anatomy	4
Elective	3
	16

Second Half-year

At University Farm, Davis

Animal Husbandry	4
Animal Husbandry	4
Agronomy	2
Feeding	3
Dairy Practice	2
Veterinary Science 111, 113	4
	19

SENIOR

First Half-year	
Animal Husbandry: Types	4
Animal Husbandry: Breeding	4
Veterinary Science	2
Farm Machinery	4
Thesis	2
	16

Second Half-year	
Agricultural Education	3
Agronomy, or Irrigation 5, or Dairy	3
Veterinary Parasitology	3
Poultry	2
Thesis	2
Elective	3
	16

POULTRY HUSBANDRY

A complete course of instruction is now being offered in all the main branches of poultry work, including breeding, feeding, housing, judging, incubation, brooding, and marketing.

In addition to the teaching certain experimental work, to discover new facts and thus improve the present methods of poultry keeping, is in progress. A one-year experiment is now being carried on to find the relative advantages of soy bean meal, meat scrap, and fish scrap as protein feeds for laying and breeding hens. Other experiments will soon be started to find the effect of confinement on laying hens, the cost of rearing chicks, better methods of incubation, and the cost of raising ducks for both market and laying. Metabolism experiments are also being carried on at Berkeley for the purpose of ascertaining the relative physiological values of the different concentrated proteins so necessary for successful egg production.

The poultry department has developed so rapidly that it is able to offer a separate course of study. Some interesting experiments are being conducted.

COURSE OF STUDY

Summer course preceding Upper Division must be taken at the University Farm, Davis.

Prerequisite to major subject: General Zoology, Introductory Physiology.

Foreign language: A reading knowledge of German or French is required.

Recommended electives: Bacteriology, Physiology, Hygiene.

JUNIOR

First Half-year	
Agronomy	3
Comparative Physiology	1
Irrigation	3
Nutrition—Gen. Principles	3
Elective	6
	16

Second Half-year At Davis	
Poultry Husbandry	4
Poultry Husbandry	4
Agronomy	4
Dairying	4
Comparative Anatomy	3
	19

SENIOR

First Half-year	
Poultry Husbandry, Breeding	4
Poultry Husbandry, Types	4
Poultry Diseases	4
Farm Machinery	4
	16

Second Half-year	
Agricultural Education	3
Agronomy or Irrigation	3
Parasitology and Poultry Diseases	4
Thesis	4
Elective	2
	16

VETERINARY SCIENCE

Instruction in anatomy, diseases and minor operations of domestic animals is given at the University at Berkeley and the Farm School at Davis.

The courses offered are designed to supplement the instruction in animal husbandry, poultry husbandry, nutrition, agricultural education, parasitology, hygiene and public health. The instruction in veterinary science does not prepare for the practice of veterinary medicine, although the equivalent of the first year of work in any veterinary college may be obtained by electing the courses suggested in the list announced herewith.

The following equipment and activities are under the supervision of members of the staff of the veterinary division and are utilized in instruction.

The Veterinary Clinic at the University Farm, Davis, affords opportunity for students to obtain instruction concerning the more common unsoundness and non-infectious diseases of farm animals. The veterinary building at Davis, used exclusively for the conduct of this clinic, is equipped with all that is necessary for advanced work in comparative pathology and bacteriology, including dairy bacteriology.

The Laboratory of Veterinary and Dairy Bacteriology at Berkeley occupies a separate building and is equipped with all necessary apparatus for advanced work in bacteriology and pathology.

The University of California Certified Dairy in Berkeley is a self-supporting institution and is run as a first class market milk dairy, producing certified milk, cream and skim milk, which are sold in Berkeley. The equipment consists of 30 acres of pasture land, a barn and sanitary milking stable, a milk house equipped with a refrigerating plant, sterilizer, bottling machine and other modern dairy machinery.

The Hog Cholera Serum Laboratory is situated in Strawberry Canyon, Berkeley, one-quarter mile east of the University buildings. Anti-hog cholera serum and vaccine are manufactured here and sold to farmers at actual cost of production. The sales during the past year were sufficient to immunize 50,000 hogs. About 200 head of swine are maintained at this laboratory for use in making the serum and vaccine.

Practice work in veterinary surgery is afforded advanced students at the University Farm.

The Veterinary Tract is 20 acres of land in Strawberry Canyon, Berkeley, set apart by the Regents of the University to be used in experimental work concerning bovine tuberculosis. The equipment consists of a barn and a cottage. At present 24 head of cattle are maintained here for purposes of research concerning immunity to tuberculosis.

The Hog Serum plant at Berkeley is situated in Strawberry Cañon.

OUTLINE OF COURSES

Suggestions for students who intend eventually to take a veterinary course in another institution.

The completion of the following courses will satisfy the minimum requirements for the first year's work in most first class veterinary colleges:

Matriculation Physics.
Matriculation Chemistry.
Zoology 1A and 5.
Physiology 1.
Laboratory Botany.
Anatomy (Histology) 101.
Animal Husbandry (Judging, Breeding, Feeding).
Dairy Industry 16.
Veterinary Science 111, 113, 118, and 119.

In addition to the above, the completion of the following courses and the attainment of junior standing will satisfy in full the requirements for one year's standing in any veterinary college in the United States:

Bacteriology (Pathology 1).
Physiology 103 (Biochemistry).
Veterinary Science 115.

DAIRY INDUSTRY

Courses of instruction in dairying are provided for three classes: (1) University students who are candidates for degrees; (2) University Farm School students; and (3) practical dairymen and creamery men. For the third class two short courses are offered: (*a*) seven weeks' course in dairy manufactures to fit men for practical creamery work, and (*b*) two weeks' course in dairy farming given in co-operation with instruction in animal husbandry to fit men to engage successfully in dairy industry. The course of study for University students is suggested below. For instruction to farm school students see page 000.

The equipment at the University Farm includes a commercial creamery, market milk room, different separators, cheese making apparatus, refrigerating machinery, disc continuous ice cream freezer, shop and tools for dairy mechanics, testing laboratories with steam and hand testers, necessary glassware for Babcock test, moisture test, salt test and casein test.

The Educational Butter Scoring Contest has closed its fourth successful year. The object is to improve California butter by having regular contests at which butter is scored, criticized and tested. The reports with suggestions are sent to the makers. Ten to twenty per cent of the creameries of the state have participated. Many samples of dairy products are tested for farmers to check their own work or that of their creameries.

COURSE OF STUDY

Summer course preceding Upper Division at University Farm, Davis.

Prerequisite to major subject: Elementary Bacteriology and Gravimetric and Volumetric Analysis.

Foreign language: A reading knowledge of German or French required; German advised.

Recommended electives: Dairy Manufactures, Nutrition, Irrigation.

JUNIOR

First Half-year

Chemistry 5A	3
Feeding of Animals (Nutrition)	2
Dairy Bacteriology (Vet. 117)	2
Agronomy (Crop Production)	3
Economics (Rural)	3
Elective	4
	16

Second Half-year
At University Farm, Davis

Dairy Industry	5
Animal Husbandry	4
Farm Machinery	4
Veterinary Science	3
Elective	3
	19

SENIOR

First Half-year

Animal Husbandry: Breeding	4
Milk Inspection	2
Veterinary Science 115	2
Thesis	2
Elective	6
	16

Second Half-year

Agronomy	2
Irrigation 5	3
Veterinary Parasitology	3
Thesis	2
Elective	6
	16

INSECT BIOLOGY AND INSECTICIDES

The work in Entomology comprises the following divisions: Apiculture, Insecticides, Insecticide Control, Insect Biology, Parasitology, Museum.

Apiculture.—The University maintains an apiary on the Campus in which students obtain practical experience in the handling of bees, including the modern methods of queen rearing, in addition to the theoretical course of lectures. Students may take advanced work in the structure or physiology of bees or in bee diseases.

Insecticides.—Instruction includes the general course in economic entomology and supplementary courses in spraying, eradication methods, horticultural laws and insecticide inspection, and lectures in the Graduate Department on the effect of adverse conditions on growth and the causes of death.

The laboratory courses afford opportunity for securing a practical acquaintance with insect pests and for original research in economic problems. Field work is provided during the appropriate season for the study of actual orchard practice in the use of insecticides.

Insecticide Control.—The State Laboratory for the control of commercial insecticides and fungicides is located in the same building and is very closely associated with the work of the research laboratories. It is the duty of this institution to examine samples of insecticides or fungicides for any user of these materials for a nominal fee to determine whether they conform to the guarantee under which they are sold. No insecticides or fungicides are saleable in this State until registered in this office, and a license secured to sell the same.

Insect Biology.—The study of the classification, structure, development and life processes of insects form the major part of the instruction in Entomology, because these subjects constitute the basis of all the other work.

In this division ample provision is made for those who desire to pursue the study of entomology as a pure science and special provision is made for students of sensory reactions, of classification and of microscopic anatomy.

Parasitology.—This is treated as the major subject next in order.

Museum.—The entomological collection has just been housed in the new fire-proof Agriculture Hall and an extensive system of exchanges from all over the world inaugurated, through which this division will come to be one of the important centers for systematic work.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: Insect Biology 1.

Foreign language: A reading knowledge of French or German is required.

Recommended electives: Insect Biology 1 in Lower Division, if possible. Consult instructor in charge of major subject regarding elective and correlated courses as well as selection of major courses.

JUNIOR

First Half-year		*Second Half-year*	
Course in major subject	3	Course in major subject	3
Correlated major course	3	Correlated major courses	3
Major course in Agriculture	3	Major course in Agriculture	3
Elective	7	Elective	7
	16		16

SENIOR

First Half-year		*Second Half-year*	
Course in major subject	2	Course in major subject	2
Correlated major course	2	Correlated major course	2
Major course in Agriculture	3	Major course in Agriculture	3
Thesis	2	Thesis	2
Elective	7	Elective	7
	16		16

PARASITOLOGY

The subject of Parasitology deals with animal parasites as causative organisms of disease and as disease carriers. It is the aim to protect the health and well being of man and of the domesticated animals as well as of the more important game animals through the control of such parasites.

Owing to the semi-tropical climate of California and its proximity to the Orient the field of parasitology is here of more than usual interest and importance and the opportunity for study and research in this direction cannot be excelled. A good collection of carefully prepared parasitic protozoa, smaller worms, insects and arachnids is available for microscopical study.

Life history, habits and especially control receive major emphasis, and for this purpose breeding cages and experimental animal cages are at hand, as well as a fully equipped dark room for sensory reaction experiments, and photographic dark rooms.

Some of the problems receiving attention are as follows: Malaria, poliomyelitis, house flies and the public health, bionomics of fleas, ticks, etc., parasites of poultry, parasites of the deer, liver flukes in sheep, scab and mange in domesticated animals, etc.

During the past three years five systematic campaigns against malaria have been organized in the Sacramento and San Joaquin valleys. These campaigns have been eminently successful in reducing malaria in a very decided manner in each locality. Assistance has also been rendered in organizing a number of house fly crusades in various parts of the state.

COURSE OF STUDY

Summer course in Parasitological Laboratory or in practical field operations must precede the Upper Division.

Prerequisite to major subject: General Zoology and Elementary Bacteriology, Parasitology 1 and 2.

Foreign language: A reading knowledge of both German and French strongly advised.

Recommended electives: Insect Biology 1 and 13 in Lower Division if possible. Physiology 1 and an elementary course in human anatomy with special reference to the thoracic and abdominal regions.

Junior

First Half-year		*Second Half-year*	
Zoology 110	3	Physical Geography 2	2
Hygiene 3	3	Hygiene 106	2
Economics 110A	3	Parasitology 116	3
Parasitology 115A	3	Parasitology 115B	3
Elective	4	Veterinary Science 115	2
		Elective	4
	16		16

Senior

First Half-year		*Second Half-year*	
Jurisprudence 18A	2	Jurisprudence 18B	2
Hygiene 104	3	Civil Engineering 24	3
Insect Biology 127	2	Pathology 102	2
Parasitology 101A (includes Thesis)	3	Parasitology 101B (includes Thesis)	3
Elective	6	Elective	6
	16		16

PLANT PATHOLOGY

The work in plant diseases is designed to give, as nearly as possible, a correct understanding of the principles involved in plant disease control and when taken with certain correlated subjects to furnish students the training necessary for undertaking intelligently the practical control measures which may be involved in any agricultural industry.

A considerable number of students will desire to acquire a more detailed knowledge of the methods of study and of the nature and causes of plant troubles than is implied in the usual execution of horticultural measures. Such training would be suitable for teachers of agriculture in high schools and for horticulturists. This would imply the ability to judge the correctness of method in reported studies, and the ability to do valid investigation within the limits of training and facilities. A considerable number of students may expect to prepare a senior thesis in this division, without having the intention of becoming technical plant pathologists.

Students intending to take advanced or special work on plant diseases should lay a thorough foundation in the allied subjects, particularly in botany, and in chemistry, physics, bacteriology, entomology, agricultural practice, and modern languages. The growing demand for specialists in this line, both in California and elsewhere, has led to increased facilities for instruction and specialization in the investigation of phyto-pathological problems, while the natural opportunities afforded for such training in California may fairly be said to be of the highest order.

Training for the specialist will vary considerably, according to the type of work which he is adapted to follow. The student of parasitic troubles should be particularly well trained in systematic and physiological mycology, and bacteriology, organic chemistry, physiology, immunity. The field and practical plant pathologist should be particularly well trained in systematic and physiological botany, soils, irrigation, plant breeding, entomology and agricultural practice. Perhaps the most exacting training of all is required by the student of physiological plant diseases, whose preparation should be particularly thorough in physiological botany, physiology, organic chemistry and physiological chemistry, in addition to a sound training in all related branches.

COURSE OF STUDY

Summer course preceding Upper Division to be arranged.

Prerequisite to major subject: General Cryptogamic Botany (first half-year).

Foreign language: For the normal training for a technical plant pathologist the minimum of foreign language should be Latin, 2 years; German, 2 years; French, 1 year; and if possible these should be taken in the order named. Further training in these and other languages, especially Italian, is desirable. For practical horticulturists the Latin may be omitted.

Recommended electives: Plant Pathology 2 and Botany 1A, 1B in Lower Division, if possible. Insect Biology 1 and 13, Economic Botany.

JUNIOR

First Half-year		*Second Half-year*	
Botany 105A	3	Plant Pathology 121	2
Chemistry 5A	3	Chemistry 8B	2
Botany 104A	3	Chemistry 8C	3
Chemistry 8A	2	Botany 104B	3
Major course in Agriculture	3	Major course in Agriculture	3
Elective	2	Elective	3
	16		16

SENIOR

First Half-year		*Second Half-year*	
Plant Pathology 122A	3	Plant Pathology 122B	3
Plant Pathology 123A	3	Plant Pathology 125B (Thesis)	2
Plant Pathology 125A (Thesis)	2	Botany 109B	3
Botany 109A	3	Major course in Agriculture	3
Major course in Agriculture	3	Elective	5
Elective	2		
	16		16

IRRIGATION

The instruction in Irrigation and Drainage offered by the Department of Irrigation for students in the College of Agriculture is designed to meet the needs of the following classes of students:

First.—Those who are planning to use a knowledge of irrigation practice as a tool to successful agriculture. That such a knowledge is important is shown by the fact that in 1910 about 45 per cent of all farms in California were irrigated. For these students, the following courses: Irrigation 1, 3, 4, and 5 are recommended; these courses may be elected by students who have chosen their major subjects from one of the groups other than Irrigation.

Second.—Those who are preparing themselves for positions in the operation, maintenance, and management of irrigation systems and companies; for investigational work such as that carried on by the United States Department of Agriculture or in agricultural colleges.

Third.—Those who desire a technical course, more closely allied to the work of the irrigation engineer, and who wish to prepare themselves for the position of irrigation superintendent or manager of irrigation systems.

For the second and third classes of students, respectively, a liberal course and a technical course in Irrigation are outlined, giving the proper correlation and sequence of allied subjects.

COURSE OF STUDY

A. LIBERAL COURSE

For students in the College of Agriculture who wish to prepare for Irrigation Farmer, Water Master, or Irrigation Manager.

Summer School Surveying (C. E. 3A) prescribed.

Prerequisite to major subject: General Physics (2A-2B), Elements of Analysis (Math. 1A-1B), and Surveying.

Foreign language: A reading knowledge of French and ability to use Spanish is advised; a reading knowledge of French or German is required.

Recommended electives: Drawing D in Lower Division. Geography 2, Jurisprudence 18A-18B, Mechanical Engineering 1A-1B, Mineralogy 1A-1B, Civil Engineering 8D, Civil Engineering 6, Soils 122, 124, Civil Engineering 16, Economics 114C, Irrigation 207.

Courses correlated with major subject shall be taken from one of the three following combinations: 1st, Soils and Agronomy; 2nd, Soils and Horticulture; 3rd, Farm Management and Economics.

JUNIOR

First Half-year		*Second Half-year*	
Irrigation 3	2	Irrigation 1	3
C. E. 1A, 1C (Surveying)	3	Irrigation 5	3
Economics 14 (Accounting)	3	C. E. 1B, 1D (Surveying)	3
Major course in Agriculture	3	C. E. 24 (Elementary water supply, Sewerage, etc.)	3
Farm Management	2	Elective	4
Elective	3		
	16		16

Civil Engineering 3A (Summer School), 3 units.

SENIOR

First Half-year		*Second Half-year*	
Irrigation 4	2	Thesis	2
Irrigation 5A	2	To be arranged	14
Major course in Agriculture	3		
Correlated courses	4		16
Thesis	2		
Elective	3		
	16		

B. TECHNICAL COURSE

For students in the College of Agriculture who wish to prepare especially for Irrigation Superintendent or Irrigation Manager.

Summer School Surveying (C. E. 3A) prescribed.

Prerequisite to major subject: Physics 2A-2B, Mathematics 3A-3B, 4A-4B, and Drawing C-D or equivalent, and Surveying.

Foreign language: A reading knowledge of French and ability to use Spanish is advised; reading knowledge of French or German required.

Recommended electives: Agronomy, Geography 2, Jurisprudence 18A-18B, Mechanical Engineering 1A-1B, Mineralogy 1A-1B, Soils 121, 122, 124, Civil Engineering 6, 8D, 16, 24; Economics 114C, Irrigation 207.

Courses correlated with major subject shall be taken from Civil Engineering and Mechanical Engineering.

Junior

First Half-year	
Irrigation 3	2
C. E. 1A-1C (Surveying)	3
C. E. 8A (Strength of Materials)	3
Mech. Eng. 102A (Engineering Mechanics)	3
C. E. 10 (Hydraulics)	3
Economics 14 (Accounting)	3
	17

Second Half-year	
Irrigation 1	3
Irrigation 2	3
C. E. 1B-1D (Surveying)	3
C. E. 8B (Strength of Materials)	2
Mech. Eng. 102B (Engineering Mechanics)	3
Elective	2
	16

Civil Engineering 3A (Summer School); 3 units.

Senior

First Half-year	
Irrigation 4	2
Irrigation 2A	2
C. E. 6 (Highway Engineering)	2
Elective	8
Thesis	2
	16

Second Half-year	
Thesis	2
To be arranged	14
	16

GENERAL INFORMATION

EXPENSES OF STUDENTS

Tuition in the University, except in the Colleges of Medicine, Pharmacy and Dentistry, is free to residents of the state. Non-residents of California are charged a tuition of ten dollars each half-year. The following incidental expenses are to be met:

Gymnasium and Infirmary Fees.—The Gymnasium fee is $2 per half-year, and the Infirmary fee is $3 per half-year; both are payable by every student, graduate or undergraduate, before his study card is filed. These fees entitle students to gymnasium and hospital privileges, and are not remitted, in whole or in part, for those who may not desire to make use of these privileges. Gymnasium privileges comprise, besides the use of the gymnasium, tennis courts, swimming pool, baths, lockers, wash rooms, etc. The Infirmary fee entitles students, in case of illness, to hospital care (cost of surgical operations not included) or dispensary treatment. One-half of the amount of these fees is returned to students who leave the University during the first half-year before September 1, or during the second half-year before February 1.

Laboratory Fees.—In the laboratories a charge is made for materials actually used. This charge, for students in the elementary laboratories, amounts to from $5 to $30 per annum.

Military Uniforms.—Every able-bodied male undergraduate student is required to take military exercises during his first two years in the University. A sum sufficient to cover the cost of the uniform, about $18, must be deposited with the Comptroller immediately after admission. Uniforms made by any other than the authorized manufacturer will not be accepted.

Board and lodging may be obtained in private families in or near Berkeley and Oakland at from $25 to $40 a month. They may occasionally be had in return for various personal services in the household. The hours of recitation are such that many students reside in Oakland and San Francisco. The journey from San Francisco requires 40 minutes. The cost of board and lodging, in students' boarding clubs, ranges from $15 to $20 a month. A few students ''board themselves'' for as low as $15 a month, but this plan of living is not generally to be recommended.

There are no dormitories maintained by the University. Lists of boarding places approved by the University authorities are published at the opening of every session, one list for men and another for men.

The *ordinary yearly expenses* of a student in the academic departments, including personal expenses, need not exceed $350.

Opportunities for Self-Support.—Board and lodging can often be obtained in exchange for three or four hours of household work daily. Self-supporting students are respected. The Young Men's and Young Women's Christian Associations act as bureaus of information concerning boarding places and opportunities for remunerative employment. The office of the President will also file applications for employment, except for teaching, and assist properly qualified students in securing it. These agencies, however, can do little for students who are not actually on the ground to negotiate for themselves. It is usually so difficult for a stranger to secure remunerative employment from the start that, in general, no one should come to Berkeley expecting to become self-supporting through the University course, without having on hand at the beginning sufficient funds to cover the expenses of the first year.

SUMMER SESSION

The Summer Session of six weeks is designed for teachers and other persons who are unable to attend the University during the fall and spring sessions. An Announcement of the Summer Session is issued in March of each year and may be obtained by addressing the Recorder of the Faculties, Berkeley, California. The Summer Session of 1913 will begin June 23 and end August 2.

UNIVERSITY FARM SCHOOL

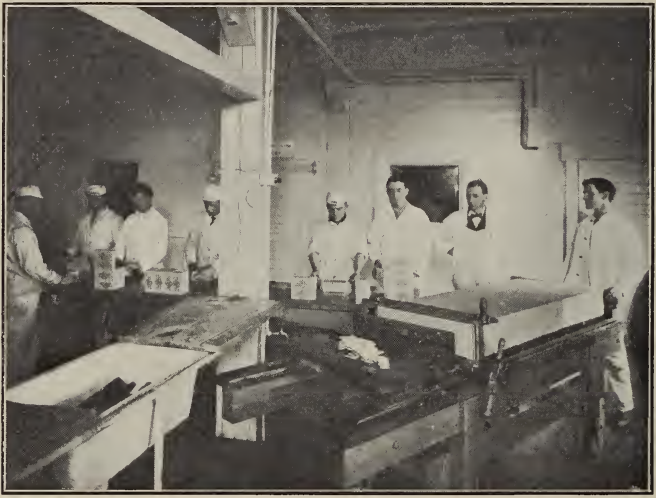
CALENDAR, 1913–14

1913	Feb.	1–3	Second half-year opens.
	Feb.	1	Registration day.
	Feb.	3	Class work begins.
	May	17	Annual Picnic.
	May	23	Commencement Day.
	Sept.	19–22	First half-year opens.
	Sept.	19	Entrance examinations.
	Sept.	20	Registration day.
	Sept.	22	Class work begins.
	Dec.	19	Christmas recess.
1914	Jan.	4	
	Jan.	5	Class work resumed.
	Jan.	24–30	Examination week.
	Jan.	31	Second half-year opens.
	Feb.	2	
	Jan.	31	Registration day.
	Feb.	2	Class work begins.
	May	16	Annual Picnic.
	May	22	Commencement Day.
	Sept.	18–21	First half-year opens.
	Sept.	18	Entrance examinations.
	Sept.	19	Registration day.
	Sept.	21	Class work begins.

Five hundred pounds of butter are manufactured daily at the University Farm School.

The purpose of the University Farm School is to furnish technical training in agriculture to young men who are not prepared or do not wish to pursue a college course in agriculture. It is not intended as a preparation for entrance to college. The regular course of study is three years. The school year is divided into two semesters of about four months each. The first semester opens about September 20 and closes late in January; the second semester opens about February 1 and closes late in May. Instruction begins promptly at the beginning of each semester; students are expected to be present on the first day and to remain until the close. A fee of two dollars is required of every student who applies for registration at any other time than the date specified in the calendar.

The chief object of the course is to give students an understanding of the natural laws which govern plant and animal production, and of the best methods of agricultural practice.



The instruction in the handling of milk and the making of butter is of a thoroughly practical character at the University Farm School.

The first year is devoted largely to training in the fundamental sciences, a knowledge of which is essential to intelligent study of the technical problems of agriculture. During the second and third years a study is made of all the more important branches of agriculture which are followed in this state. A large proportion of the work is done in laboratory, field and shop. Most of the time is given to technical subjects; but English and practical mathematics are studied throughout the course, while some work in history, civics and economics is also included.

The basis of entrance to the Farm School is ability to pursue with profit the assigned course of study, and to maintain the prescribed standard of class excellence. Applicants are not admitted below the age of eighteen years, unless they are graduates of a high school of recognized standing. Those who are not graduates of a high school are required to pass entrance examinations in English composition and arithmetic. Intrants will not be admitted to full standing until after satisfactory completion of one semester's work.

Evidence of good moral character is required from every applicant; also a satisfactory recommendation from the school last attended.

Application for admission should be accompanied by the necessary credentials. They should be sent to the Dean of the University Farm School so as to reach him, if possible, before September 1. Arrangements for board and room on the Farm should also be made in advance.

Students who live in the dormitories are subject to reasonable rules of house discipline, administered by student officers under the supervision of a resident instructor. The buildings are under the care of a matron. Each dormitory has a large, comfortably furnished living room for the common use of all its residents. The social life of the school centers about the dormitories, and the close association of dormitory life is itself a powerful educative force.

It will be of interest to parents of prospective students to know that by an act of the Legislature of 1911 the sale of intoxicating liquors within three miles of the University Farm is prohibited.

An association has been formed by the students of the Farm School for the support and control of all student activities. This organization is gradually developing along lines leading to student self-government. Its athletic branch arranges for interscholastic contests in various field sports. A student paper, *Agricola*, is published annually, at the close of the school year.

A limited opportunity to earn part of their expenses by labor about the Farm School may be offered to earnest students who are good workers. In general there is not enough work which can be done conveniently by students to supply the demand. Students should not come to the school expecting to earn a large part of their expenses.

The rent of dormitory rooms is about $6 per month, varying somewhat with the location and size of the room, number of occupants, etc. Board in the dining hall is $20 per month.

At the University Farm School the students have their meals in a common dining room.

Tuition is free at the University Farm School. To help meet the cost of materials actually used up by students in class room and laboratory, a small incidental fee is charged each student. This fee is $5 per semester for residents of this state, $15 per semester for non-residents.

At the beginning of each semester all students are required to make two small deposits. One of these, amounting to $5, is a deposit against breakage of apparatus used in any of the classes. A deposit of $3 is required of each dormitory resident, to pay for possible damage to his room or furniture, or to the building. The unused part of these deposits will be returned two weeks after the close of each semester.

Books and regular school supplies cost from $15 to $25 per year. Special clothing, such as white suits for the creamery and overalls and jumpers for field and laboratory work, costs about $1 per suit. The total expense of an eight months year need not exceed $250.

The old fig trees on the University Farm are excellent subjects for practice in tree surgery.

COURSE OF STUDY

NOTE.—The work is estimated in terms of ''credits.'' One credit is equivalent to one hour of class room or two hours of laboratory or practice work. In each semester the left-hand column indicates the number of one-hour periods, the middle column (in parenthesis) the number of two-hour periods, and the right-hand column the number of credits. By multiplying the total of the middle column by 2 and adding this number to the total of the first column the actual number of hours per week devoted to class work is obtained. For graduation 120 credits plus four months of practical work along the line of the major subject are required.

FIRST YEAR

First Half-year				*Second Half-year*			
Botany and Horticulture	3	(2)	5	Botany and Horticulture	3	(2)	5
Chemistry I	2	(2)	4	Chemistry I	2	(2)	4
English I	4		4	English I	4		4
Mathematics I	4		4	Mathematics I	4		4
Stock Judging I		(2)	2	Stock Judging I		(2)	2
Drawing		(2)	2	Carpentry		(2)	2
Hygiene	1		1	Hygiene	1		1
	14	8	22		14	8	22

SECOND YEAR

Horticulture Group

Mathematics II	4		4	Mathematics II	2		2
Farm Mechanics		(2)	2	Forging		(2)	2
Soils	2	(1)	3	Farm Crops	2	(1)	3
Deciduous Fruits (Hor. II)	3	(3)	6	Agricultural Chemistry II	2		2
Entomology	2	(2)	4	Deciduous Fruits (Hor. II)	3	(3)	6
				Plant Diseases	2	(2)	4
	11	8	19				
					11	8	19

Electives

Small Fruits (Hor. III)	2	(1)	3	Small Fruits (Hor. III)	2	(1)	3
Poultry I	2	(1)	3	Poultry I	2	(1)	3
English II	3		3	English II	3		3
History I	3		3	History I	3		3

Animal Industry Group

Mathematics II	4		4	Mathematics II	2		2
Farm Mechanics		(2)	2	Forging		(2)	2
Soils	2	(1)	3	Farm Crops	2	(1)	3
Dairy	3	(1)	4	Agricultural Chem. II	2		2
Poultry I	2	(1)	3	Dairy	3	(1)	4
Breeds and Judging II	2	(2)	4	Poultry I	2	(1)	3
				Breeds and Judging II	2	(2)	4
	13	7	20				
					13	7	20

Electives

Horticulture II	3	(3)	6	Horticulture II	3	(3)	6
Horticulture III	2	(2)	4	Horticulture III	2	(2)	4
English II	3			English II	3		
History I	3			History I	3		

THIRD YEAR

Horticulture Group

First Half-year				*Second Half-year*			
Civics	3		3	Economics	3		3
Irrigation and Surveying	2	(2)	4	Irrigation and Surveying	1	(2)	3
Farm Management	2	(1)	3	Farm Machinery	2	(2)	4
Olericulture	2	(2)	4	Olericulture	1	(2)	3
Horticultural Economics	2	(1)	3	Horticultural Economics	1	(1)	2
	11	6	17		8	7	15

Electives

Viticulture	2	(2)	4	Viticulture		(2)	5
Greenhouse Industry and Landscape Gardening	3	(3)	6	Greenhouse Industry and Landscape Gardening	3	(3)	6
Citrus and Semitropical Fruits	2	(2)	4	Citrus and Semitropical Fruits	2	(2)	4
English III	3		3	English III	3		3
History II	3		3	History II	3		3

Animal Industry Group

Civics	3		3	Economics	3		3
Irrigation and Surveying	2	(2)	4	Irrigation and Surveying	1	(2)	3
Farm Management	2	(1)	3	Farm Machinery	2	(2)	4
Market Milk	1	(1)	2	Feeding	2		2
Feeding	2		2	Veterinary Science	1	(2)	3
Stock Management	1	(2)	3		9	6	15
	11	6	17				

Electives

Fancy Poultry Judging		(2)	2	Dairy Manufactures	1	(1)	2
Milk Production	2		2	Incubation and Brooding		(2)	2
History II	3		3	Herd Books and Breeding	2		2
English III	3		3	History II	3		3
				English III	3		3

NOTE.—Four months of practical work along the line of the major subject chosen must be completed before graduation.

BULLETINS OF THE AGRICULTURAL EXPERIMENT STATION AVAILABLE FOR FREE DISTRIBUTION

No. 128. Nature, Value, and Utilization of Alkali Lands, and Tolerance of Alkali. (Revised and Reprint, 1905.)
133. Tolerance of Alkali by Various Cultures.
147. Culture work at the Sub-stations.
164. Poultry Feeding and Proprietary Foods.
167. Manufacture of Dry Wines in Hot Countries.
168. Observations on Some Vine Diseases in Sonoma County.
169. Tolerance of the Sugar Beet for Alkali.
170. Studies in Grasshopper Control.
171. Commercial Fertilizers. (June 30, 1905.)
174. A New Wine-cooling Machine.
176. Sugar Beets in the San Joaquin Valley.
177. A New Method of Making Dry Red Wine.
178. Mosquito Control.
179. Commercial Fertilizers. (June 1906.)
181. The Selection of Seed-Wheat.
182. Analysis of Paris Green and Lead Arsenic. Proposed Insecticide Law.
183. The California Tussock-moth.
184. Report of the Plant Pathologist to July 1, 1906.
185. Report of Progress in Cereal Investigations.
186. The Oidium of the Vine.
187. Commercial Fertilizers. (January, 1907.)
188. Lining of Ditches and Reservoirs to Prevent Seepage and Losses.
198. Commercial Fertilizers. (June, 1907.)
191. California Peach Blight.
192. Insects Injurious to the Vine in California.
193. The Best Wine Grapes for California; Pruning Young Vines; Pruning the Sultanina.
194. Commercial Fertilizers. (Dec., 1907.)
195. The California Grape Rootworm.
No. 197. Grape Culture in California; Improved Methods of Winemaking; Yeast from California Grapes.
198. The Grape Leaf-Hopper.
199. Bovine Tuberculosis.
201. Commercial Fertilizers. (June, 1908.)
202. Commercial Fertilizers. (December, 1908.)
203. Report of the Plant Pathologist to July 1, 1909.
204. The Dairy Cow's Record and the Stable.
205. Commercial Fertilizers. (December, 1909.)
206. Commercial Fertilizers. (June, 1910.)
207. The Control of the Argentine Ant.
208. The Late Blight of Celery.
209. The Cream Supply.
210. Imperial Valley Settlers' Crop Manual.
211. How to Increase the Yield of Wheat in California.
212. California White Wheats.
213. The Principles of Wine-making.
214. Citrus Fruit Insects.
215. The House Fly in its Relation to Public Health.
216. A Progress Report upon Soil and Climatic Factors Influencing the Composition of Wheat.
217. Honey Plants of California.
218. California Plant Diseases.
219. Report of Live Stock Conditions in Imperial County, California.
220. Fumigation Studies No. 5; Dosage Tables.
221. Commercial Fertilizers. (Oct. 1911.)
222. The Red or Orange Scale.
223. The Black Scale.
224. The Production of the Lima Bean.
225. Tolerance of Eucalyptus for Alkali.
226. The Purple Scale.
227. Grape Vinegar.
228. Pear Thrips and Peach Tree Borer.
229. Hog Cholera and Preventive Serum.
230. Enological Investigations.
231. Walnut Culture in California. Walnut Blight.

CALENDAR

1913	
Jan. 6, Monday	Applications for admission in January and applications for cards of admission to the matriculation examinations in January, to be filed.
Jan. 7, Tuesday Jan. 11, Saturday	Examinations in the Academic Colleges for the removal of matriculation deficiencies.
Jan. 13, Monday	Registration of students in the Academic Colleges for courses of the second half-year.
Jan. 14, Tuesday	Instruction in all classes begins at 8 a.m.
April 1, Tuesday	Last Day for applications for undergraduate scholarships for 1913-14.
April 28, Monday May 10, Saturday	Annual examinations in the Academic Colleges. Annual examinations for seniors begin Thursday, April 24.
May 14, Wednesday	The Fiftieth Commencement.
May 15, Thursday Aug. 6, Wednesday	Vacation of twelve weeks in the Academic Colleges, Hastings College of the Law, and the College of Medicine.
June 23, Monday Aug. 2, Saturday	Summer Session of the Academic Colleges.
Aug. 4, Monday	Applications for admission, and credentials of the recommended graduates of accredited high schools to be filed with the Recorder of the Faculties.
Aug. 7, Thursday Aug. 12, Tuesday	Matriculation examinations at Berkeley, for the Academic Colleges, the California College of Pharmacy, and Hastings College of the Law. Filing of applications for admission to advanced and graduate standing and to special status.
Aug. 15, Friday Aug. 16, Saturday	Admission certificates issued to intrants; registration of new students, graduate and undergraduate, from 8:30 a.m. to 4:30 p.m., in California Hall.
Aug. 18, Monday	Registration of old students, graduate and undergraduate, 8:30 a.m. to 5 p.m., in California Hall.
Aug. 19, Tuesday	Instruction in all classes begins at 8 a.m.
Nov. 27, Thursday Nov. 29, Saturday	Thanksgiving Recess of three days.
Dec. 8, Monday Dec. 20, Saturday	Mid-year Examinations in the Academic Colleges.
Dec. 21, Sunday Jan. 3, Saturday	Christmas vacation in the Academic Colleges, Hastings College of the Law, the College of Medicine, the College of Dentistry, and the California College of Pharmacy.
1914	
Jan. 3, Saturday	Applications for admission in January and applications for cards of admission to the matriculation examinations in January, to be filed.
Jan. 6, Tuesday Jan. 10, Saturday	Examinations in the Academic Colleges for the removal of matriculation deficiencies.
Jan. 12, Monday	Registration of students in the Academic Colleges for courses of the second half-year.
Jan. 13, Tuesday	Instruction in all classes begins at 8 a.m.

UNIVERSITY OF ILLINOIS-URBANA
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UNIVERSITY OF CALIFORNIA BULLETIN

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Issued monthly from July to March, and twice a month from April to June

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These Bulletins include:

- The Circular of Information, Colleges of Letters, Sciences and Engineering.
- The Annual Announcement of the Summer Session.
- The Annual Announcement of the Colleges of Dentistry, Law, Medicine and Pharmacy.
- The President's Biennial Report.